



MAY 1945

25 CENTS

AMERICAN
FORESTS



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"We're coming your way with switchboards"

It takes time to make them and a lot of time to put them in. But we're hustling right along with the job.

We've made a dent in the pile of orders where the principal shortage was a telephone instrument. Most of the longer waits are where switch-

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You can be sure of this: We're putting everything we have into the job of getting telephone service back to normal. And then making it better than ever.



BELL TELEPHONE SYSTEM

AMERICAN FORESTS

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The Purpose

The American Forestry Association is a national organization—educational in character—for the advancement of the intelligent management and use of the country's forests and related resources of soil, water, wildlife and outdoor recreation. Its purpose is (1) to bring about adequate protection and perpetuation of these resources by creating an enlightened public appreciation of the need of conserving them through wise use for the present and future welfare and enjoyment of all the people; (2) to make available to Americans in all walks of life a wider knowledge and appreciation of their forest resources and the part they can play in the social and industrial life of our nation.

The History

MORE THAN half a century ago American men and women of vision, stirred by the rapid destruction of forests and forest life in the United States, began to raise their voices in behalf of conservation. Foreseeing the danger of allowing America's rich forests and vast natural wealth to be thoughtlessly wasted, these public-spirited individuals protested the needless destruction that was taking place. Out of their efforts came a collective force.—The American Forestry Association, first organized in 1875 and made a national influence in 1882.

The Record

THUS The American Forestry Association has a long record of efficient public service. The establishment of the United States Forest Service and the creation of the nation-wide system of state and national forests and parks were due in no small part to the Association's efforts. Its educational work, extending over more than seventy years, has stimulated public action and built public support for protection against forest fires and floods; for prevention and control of soil erosion; for the development of conservation policies in forest management for continuous production through wise use; for the control of forest insects and diseases and the preservation of fish and wildlife.

The Support

FROM AN ORGANIZATION of a few hundred members three decades ago, the Association has attained a substantial membership of many thousand men and women, living in every state in the Union and in foreign countries throughout the world. The funds of the Association are administered by a Board of Directors composed of individuals of national standing—men and women who give their services free, who have a practical understanding of the nation's present-day conservation needs, and are equipped through experience, ability, enthusiasm and training to advance the Association's program.

The Program

BECAUSE OF its independent, non-political character, the work of The American Forestry Association is vitally necessary in the field of public service. It provides an unprejudiced influence for the development of sound conservation measures. It helps coordinate public, state and federal policies. It cooperates closely with federal, state and private agencies in conservation work. At the same time it initiates, sponsors and carries on needed projects in conservation in addition to its regular broad continuous program of education.



MY FAVORITE TREE

THE tree in which I take greatest delight is the horsechestnut. Its pyramids of white bloom, each blossom tinged with delicate color at the center, stand out with almost feminine charm against the glossy dark green of the leaves; and even at this season of eye-catching display, the tree is saved from mere flamboyance by the classic regularity of its design.

To me, the horsechestnut seems to record the passing of seasons more gracefully and with greater sensitivity than any other growing thing. As spring passes, falling blooms dot the lawn and a cone of lush foliage shimmers in the heat. In September, the smooth brown fruit bursts from its prickly husks, and an edge of brown on each leaf is one of the first signs of autumn. When days grow cooler, the margins of brown widen; and the falling of the leaves, finally brown to their centers, is a sure sign that autumn has come to stay. The symmetrical arrangement of leafless boughs accents the clean, sharp lines of a winter landscape; and when spring comes, the leaves that will later give a thick, green shade are fragile, gray-green things, almost transparent—the very symbol of a waking earth.

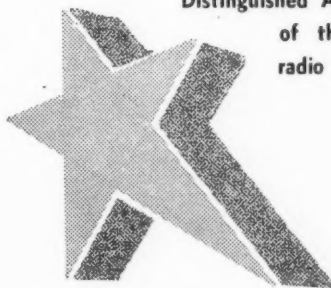
I love the horsechestnut, too, because for all its decorative appearance it is one of the sturdiest and most self-reliant of trees. Requiring little in the way of care, it offers its perfection as a gift of nature to all lovers of beauty.



By

GLADYS SWARTHOUT

Distinguished American mezzo-soprano
of the Metropolitan Opera,
radio and motion pictures





Keeping the Facts Straight

(The following letter by Ovid Butler, executive director of The American Forestry Association, to Mrs. Max J. Schmitt of Wauwatosa, Wisconsin, who lists herself as executive director of "Forests," is published to correct misstatements and untruthful propaganda concerning The American Forestry Association — Editor's note.)

Dear Mrs. Schmitt: From some unrevealed source there has come to me a two-page mimeographed circular entitled "FORESTS" which purports to speak for an organization of the same name. On page 2 of this circular is published the following note:

"PEACE—IT'S WONDERFUL

"Now that the war has ended with a sweeping victory over fascism, we who are interested in forestry are wondering whether those who advocated all out clear-cutting for war production will reverse their stand. In particular we think of Ovid Butler and his American Forestry Association who thought selective cutting would hold up timber production. Will he and his lumbermen board of directors take a strong stand favoring immediate regulation? Or will they merely continue to print a very attractive set of pictures?"

Although I have been in forest conservation work upwards of forty years, I am not familiar with your organization, its program, activities, accomplishments or its public integrity and responsibility. I note that the material carried by the circular, however, is signed by you as secretary, so I conclude that the note quoted above was written by you. In any event, you are responsible for its publication.

To the informed person, it will be recognized for just what it is—untruthful propaganda designed to promote your own theory of federal control by resorting to the reprehensible

practice of maligning and misrepresenting another organization and the men who compose its Board of Directors.

What makes the practice all the more reprehensible in your case is that you know your insinuated representations are not the truth.

You know that early in the war you individually attacked us for not taking up your shibboleth of federal control of all forest and wood lands and for our position that domestic controversies should be set aside during the war in the interest of meeting the nation's military needs for wood, paper and other forest products. You advocated with what seemed to me intemperate and unrealistic zeal a course of action which as the war experience now clearly shows would have seriously crippled the war effort.

You know that at that time I wrote you fully explaining in some detail the wood emergency confronting the nation and assuring you that by no stretch of the imagination could any patriotic person interpret our position as a call for clear-cutting or destructive lumbering. You know that my letters of that date—early 1942—and copies of AMERICAN FORESTS throughout the war belie your misrepresentations and cancel out any excuse you may offer for being uninformed.

During the seventy-five years of its activities in behalf of forest conservation, the Association never once has advocated "all-out" clear-cutting or destructive lumbering, and I challenge you to prove otherwise.

You know also that the Association's Board of Directors is not a "lumbermen board." Our Board of Directors consists of seventeen members, whose names are published in every issue of AMERICAN FORESTS. Only three of these are in any way connected with forest industry. By your own admission, you see AMERICAN FORESTS, so again you have no excuse to say you were uninformed.

Finally, you know that the Associa-

tion's magazine, AMERICAN FORESTS, is not merely an "attractive set of pictures" as you attempt to represent. You know perfectly well that if confronted by an exhibit of typical copies of AMERICAN FORESTS and a jury of honorable men or women, you could not support your insinuating charge.

If I may add a concluding thought it is that by your methods you are rendering a disservice to your own program, however meritorious it may be, and to the progress of forest conservation everywhere. — Ovid Butler, Executive Director, The American Forestry Association.

(Also registering protest was J. N. "Ding" Darling, noted cartoonist and conservationist, whom Mrs. Schmitt lists as a director of "Forests." On March 16 he wrote Mrs. Schmitt as follows—Editor's Note.)

MADAM:—Having refused to become affiliated with your organization and having explained fully the reasons for my lack of belief in either your magazine project or your efforts to place a new organization in the field which is already served by The American Forestry Association, I am amazed at your effrontery in placing my name on your directory list.

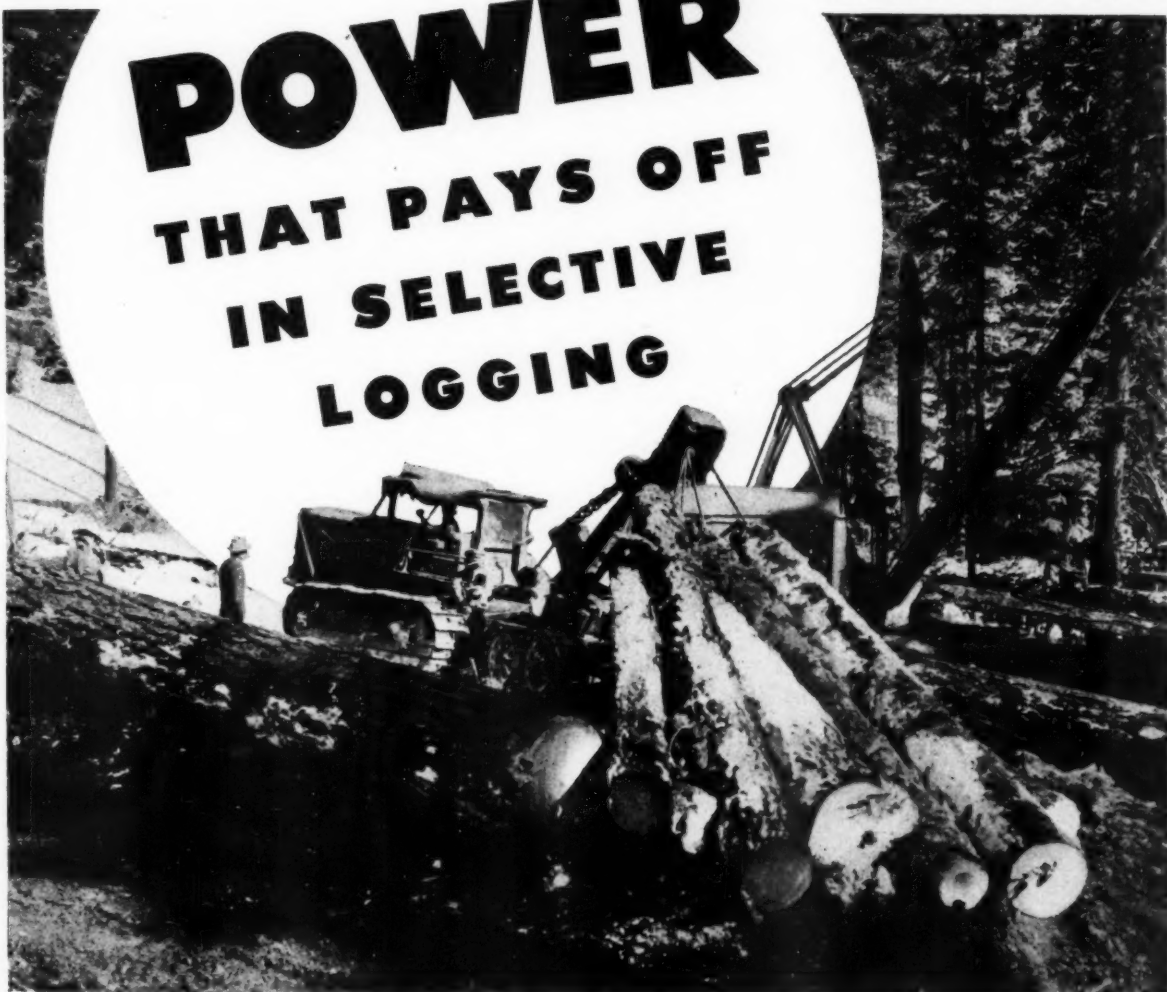
In view of this breach of common respect for my wishes and your recent uncalled for attack upon Ovid Butler and The American Forestry Association, it seems only a reasonable request that you furnish me with your mailing list in order that I may correct the unfair impression which you have publicly broadcast.—J. N. Darling, Des Moines, Iowa.

Louis Bromfield, famous author and conservationist, who is a member of the Board of Directors of The American Forestry Association and who is listed as a director of Mrs. Schmitt's organization, writes the Association: "I know nothing about her (Mrs. Schmitt) and have no record or memory of becoming a director of her organization."

POWER

THAT PAYS OFF IN SELECTIVE LOGGING

A "Caterpillar" Diesel D8 Tractor with Hyster arch delivers 2500 to 3000 ft. of logs to the truck landing in Collins Almanor Forest, Calif.



FAR-SIGHTED logging that plans for future yield requires the right kind of power in the woods. Long hauls and good haul roads play an important part in selective logging. And sure-footed tractors with plenty of dependable beef on the drawbar are needed to get logs to the landing without injury to young growth.

In the privately owned Collins Almanor Forest, near Chester, California, a fine stand of ponderosa and sugar pine is now being logged selectively. "Caterpillar" Diesel D8 Tractors with Hyster

arches do an efficient job of delivering logs to the truck landings, in spite of the snow and cold at 5000 feet elevation. All logs are trucked as much as 20 miles to the mill, over private highways. Between logging jobs the same versatile tractors are available for building and repairing haul roads.

Experienced loggers know they can depend on "Caterpillar" Diesel equipment for rugged construction, long life and low operating and maintenance cost. "Caterpillar" builds 'em tough.

CATERPILLAR TRACTOR CO. • PEORIA, ILLINOIS

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Editorial

A Forward Step in Forestry

RECENT action taken by the Virginia General Assembly in providing on-the-ground forestry services to its woodland-owning citizens is worthy of note. By special act of its legislature the state has provided its forestry department with an operating budget — \$52,800 in this instance — to be used exclusively to assist woodland owners to apply forestry methods in the management of their timber growing properties.

Like many other states, Virginia in the past has endeavored to furnish such services but has been able to do so only on a very limited scale because funds have been too meager and uncertain. The result has been that many landowners who have wished to apply forestry but have lacked the know-how have done little or nothing to improve their woodlands. A similar situation prevails in many other states where on-the-ground service and education for woodland owners rests, as in Virginia, mainly on such assistance as can be obtained through federal aid under the Norris-Doxey Act. Funds from this source are not only pitifully small but the act restricts their application to farm woodlands.

Between the farmer and the large timberland owner financially able to employ foresters, there are in every forested state millions of acres in small woodland tracts owned by people who do not qualify for assistance under the Norris-Doxey Act. The Virginia legislation opens the door

for the state forester to help this middle group of owners to manage and develop its properties by good forestry methods. Furthermore, it enables the state forester to charge for the services rendered and thereby to spread his assistance over a relatively large amount of forest land now urgently in need of forest management.

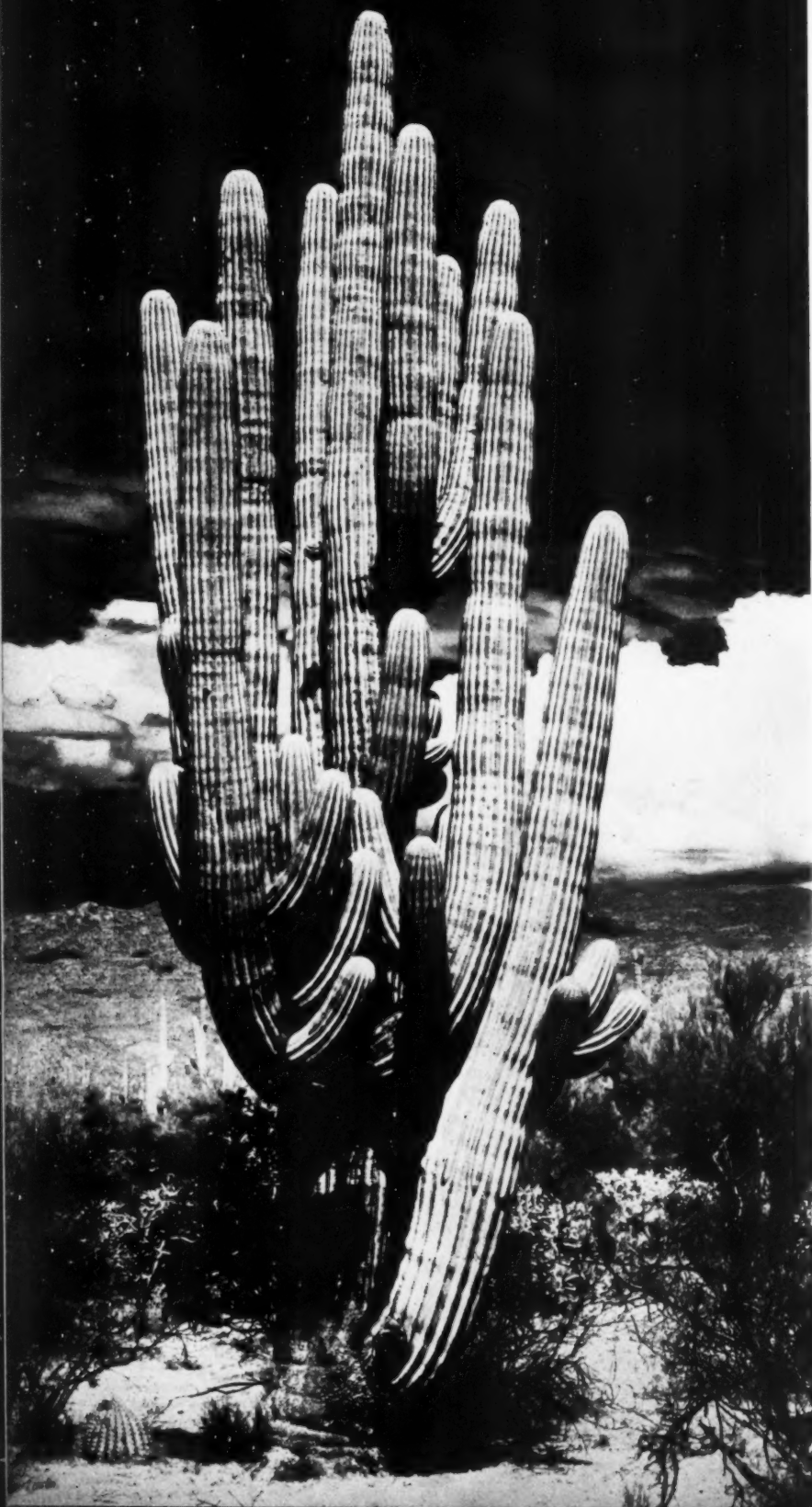
Thus Virginia takes forestry out of the clinical or charity stage and gives it an opportunity to establish itself on a practical dollar-and-cents basis. When a landowner can see profit in hand from professional advice and assistance the desirability of the service is quickly apparent. By establishing the service as a state function, Virginia gives recognition to the fact that good forestry is in the public interest and by making a moderate charge for the services rendered it demonstrates to the landowner that forestry is a vital part of land management. In another direction the legislation is challenging in that it places the state forester and his men on their metal to show that good forestry will yield greater profit from sustained yield of woodland crops.

In promoting state extension forestry, the Virginia act authorizes the state forester to give a certain amount of free service in the way of demonstrations of approved forestry principles. Such demonstrations, however, are to be limited to areas of not more than 10 acres each. To this extent the state forester is permitted to advertise his service to landowners by demonstrating to them without

cost how they can profit by better management of their woodlands. This is a technique successfully applied to many commodities and services in other lines of American business.

The Virginia program should succeed. The time is ripe for it and there is a potential demand for it. Its first step to success undoubtedly will be its hardest and most important. This is for the state forester to obtain a staff of forest technicians especially qualified for the type of work they are called upon to do. These men, we believe, will determine the success or failure of the program because upon them will fall the task of making their services worth the cost to landowners. Once qualified men are at work, results should be testimony that forestry as a business can be instilled in landowners by establishing business methods—a field of endeavor which the state hopes eventually to have more largely served by private consultants.

It is well recognized that the greatest need of forestry today is in the hundreds of thousands of small woodland tracts scattered through the nation whose owners know little or nothing about forestry and therefore are doing nothing to maintain and develop timber growing possibilities. Virginia's meeting this need within its own boundaries sets a pattern which it is hoped other states will note and adopt. The success of its program is bound to have a stimulating influence for better forest management both in and out of the state.



By JOHN L. BLACKFORD

OVER its low-curving lomas, on table-top mesas, up rock ridges, out across paved plains of the desert, fantastic "forests" fling their weird branches to the sky or thrust the spikes of their "tall timber" into the sunset. Here is the most improbable woodland fancy might picture; yet everywhere it is confirmed by the startling reality. Here are "timberlands" without trees—fantastic forests of tree-lilies, giant cacti and yucca. They are perhaps Mother Nature's most marvelous substitution. Wherever her agents of weathering gather a bit of soil, nature seeks to clothe it with living green. Only the bleakest polar wastes and most forbidding deserts are devoid of a multiplicity of ingenious plant forms. Always it becomes the endeavor of every plant society to raise its more ambitious members above the lowly state in which they first carpet the earth, to create loftier "layers" of growth, and thus to bring the land truly into fruit and flower.

Nature's efforts to attain this end have been crowned with those higher forms we know as trees. And the effect of this achievement—the evolution of our forests—upon all life, both plant and animal, has of course been incalculable.

It then becomes endlessly intriguing to adventure in a land of climatic extreme, such as our arid Southwest, and discover what has happened in a region where few trees have survived; where even their much altered representatives, the palo verde,

Massive trunk and columnar branches characterize old Don Saguaro whose life span may exceed 250 years. These giant cacti function as trees of the desert

Desert Forest



mesquite, ironwood, and the picturesque elephant and smoke trees, play a greatly restricted role in the biotic community.

Perhaps nature's most spectacular achievement here has been the success in evolving, under conditions of torrid heat and prolonged drought, those forms of plant life that, while bearing only the remotest relationship to trees, have adequately taken their place and fulfilled the functions of the true arboreal species. Thus giant forms of the weird cactus clan, huge "trees" of the lily family, tree-yuccas and other outlandish innovations have been designed and developed to withstand the desert's searing sun.

They manage to provide a limited shade, an effective shelter, and a dependable food supply for the furled, feathered and scaly denizens of the wastes. This "upper story" of the desert's vegetation, while often scattered or limited to grotesque, savannah-like groves, frequently assembles its curious members into fantastic "forests". In them, desert life attains to greatest variety and abundance.

In the native Indian economies, such as the Papago and Pima, wood-like "ribs" of the saguaro are utilized as poles for building light frame work. The many-stemmed ocotillos provide wattles for shelters, staves for enclosures, and roofing for airy ramadas. Yuccas furnish essential fibres for cordage, mats and baskets; yucca roots oblige with a superior soap. Spines of the cacti serve admirably as punches and awls, their fruit pulp for preserves, and their juices for fermented drinks. The fruiting of the great saguaros in June is the traditional happy harvest time in Papago Land reaching across the wide and picturesque Sonoran Desert of southern Arizona.

About these odd and fascinating "trees" also revolves the life his-



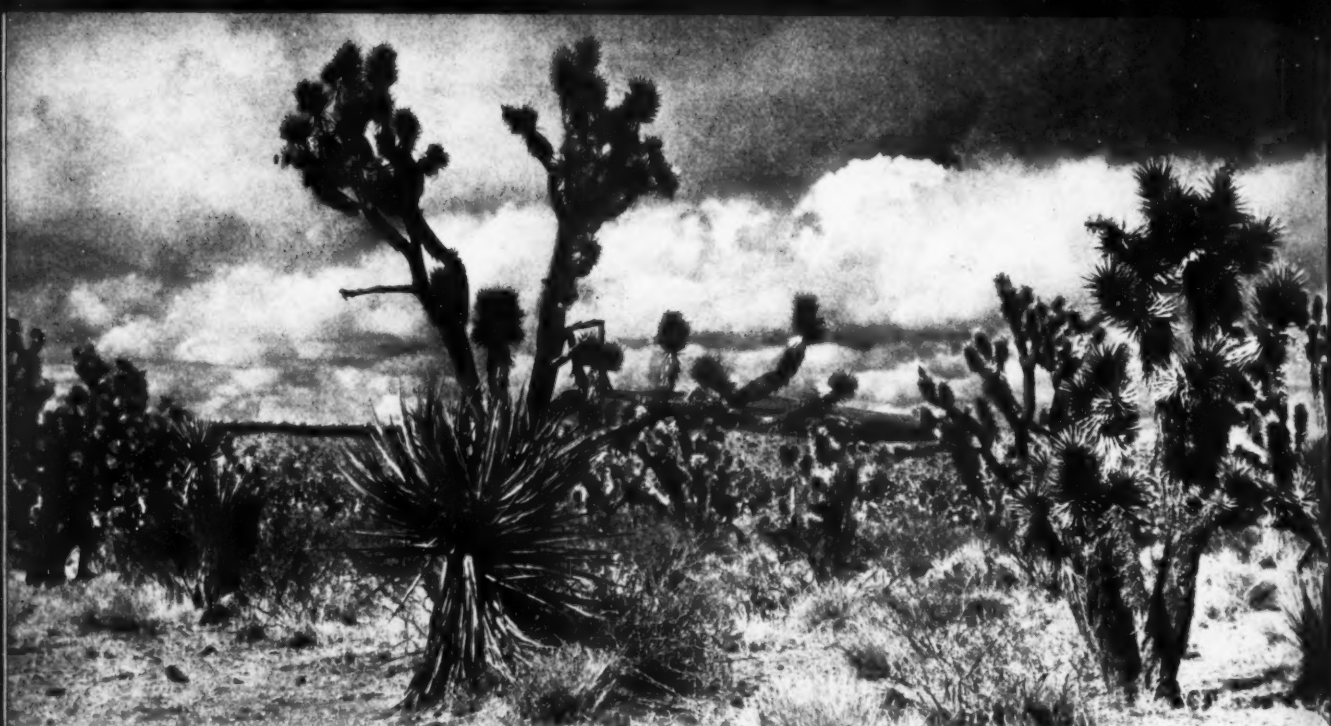
Despite its evil armor, tree cholla is a veritable sanctuary to the cactus wren and other birds that know how to avoid its dangerous embrace

tory of unnumbered wild things. The huge cacti stems and pads are frequently the reservoirs of moisture for herbivorous residents like the chuckwalla. Their delicate, colorful blossoms support the bees and kindred *Hymenoptera*. Saguaro's tissues become the home of myriad insects throughout the larval stage. Spines, spicules and thorns repel predators,

and constitute impregnable retreats for smaller members of the desert community.

So well do the giant cacti function as trees that they have attracted several expert woodworkers to their desert forests—the golden-winged, red moustached gilded flicker, the noisy Gila woodpecker, and the

In the Southwest is found Nature's most marvelous substitution for trees—fantastic "forests" of tree-lilies, giant cacti, yucca and other weird innovations developed to withstand hot sun



Over the desert's low-curving lomas fantastic forests fling their weird branches to the western sky. Scattered groves of the Joshua tree grow upon otherwise featureless stretches from Arizona to California

friendly little speckle-check or cactus woodpecker. These most confirmed of all woodfolk, through their ability to excavate perfect homesites within the prickly trunks of the saguaros, have thrown the arid lands open to settlement by many other feathered squatters. So long has this strange partnership continued that today the distribution of the gilded flicker and the Gila woodpecker almost exactly coincides with the range of the huge cactus itself.

Massive trunk and columnar branches characterize old Don Saguaro, whose life span may exceed 250 years. Far-ranging stands of the giant provide the tall "timber" of the desert. About the saguaros, which can blossom and fruit for three years without rain, revolve the life cycles of numerous other interesting life forms.

Symmetrical and majestic, they tower to a height of 30 to 50 feet. Their spiked and spiny, fluted, accordion-like trunks expand after rains to serve as "tanks" for conserving the precious moisture. Waxy, white, gold-centered blossoms appear in May to become the rendezvous of insect life, thus attracting flycatchers, orioles and other birds to a desert feast. The crimson pulp of the egg-shaped fruit is prized by unnumbered admirers—Indians, coyotes, rodents, Gila woodpeckers and white-winged

doves. The Papago calendar, it is interesting to relate, begins with the fruiting of *Cereus giganteus*.

Splicing together the long "ribs" from a weathered saguaro skeleton with tough agave fibres, Papago pickers harvest the juicy *pitahayas* or fruit. Then Papago girls remove saguaro seeds from the sticky, red pulp, that is destined to serve as jam and preserves. The multitude of tiny black seeds, when stored and dried, may be ground into meal or made into a paste with which to butter tortillas.

Over sun-scorched rock ridges flanking the Puerto Blancos climb the huge organ pipe cacti that cross the border from Mexico. They do not resemble trees even so much as the leafless, green-rinded palo verde clustering around them, but desert dwellers are grateful for their narrow shade and delicious, green, globular, scarlet-fleshed fruit. Accompanying them into the unique Organ Pipe Cactus National Monument in Arizona, straggles the similarly large, shaggy, long-spined whisker or old man cactus.

Forests of bayonet-bladed tree-yuccas break the monotony of the desert grasslands of New Mexico. Their bristling groves provide cover from predators, weather-shelter, elevated perches, nesting sites and ma-

terials, edible seeds, and much-sought-for shade for the wildlife that seeks their protection. White-necked ravens, ash-throated flycatchers and black-and-lemon Scott orioles are characteristic "boarders" with them. In countless ways they discharge the duties of trees where the latter cannot exist.

Treacherous "jumping" tree cholla exhibits the branching, arboreal form that distinguishes several species of this fierce cactus clan. Despite its evil armor it is a veritable sanctuary to the cactus wren, the sweet-voiced thrasher and others that know how to avoid its dangerous embrace. The spiny, loosely-attached joints are employed by the precocious southwest woodrat in barricading his residence and runways, thereby effectively deterring many unwanted callers at his address.

Many-colored tree cholla, growing abundantly east of Tucson, resembles an orchard tree in its habit of growth. Unbranched trunks may be two or three feet high, with the main stem reaching 12 feet. The intricate branches form a rounded head almost as wide across. Dull purple or green, thorn-studded joints put out red, purple, or maroon blossoms, and hold their small green fruit for nearly a year. This weird tree-dwarf thrives on the Sonoran Desert that reaches its climax in adjacent Mexico.

Along the border another curious tree cholla lifts snaky branches and Medusa-like crown above the desert scrub. Its curious, succulent-type base contrasts with the woody trunks of the two preceding species. Here the javelina or wild hog is a member of the exotic fauna harbored by the strange cover of creosote bush, tree cholla and saguaro. Flower buds of *Opuntia arbuscula*, a fourth large tree cholla of the region, supply the Papago with a tasty salad.

Though tree-like, jumping cholla growths are not like other forests. Slightest contact with the "foliage" may cost hours of painful probing for the treacherous spines. Still, distinctive communities of wildlife have evolved to take advantage of the peculiar conditions of refuge afforded within them. Golden-spined jumping cholla, ranging throughout central Arizona, sometimes grows densely to a height of 15 feet. Kit fox, Gila monster, cactus wren and road runner find security in its fantastic, impenetrable groves.

From a short, stout trunk the flap-jack prickly pear thrusts out jointed arms to form a rounded head of succulent, spicule-studded pads, attractively ornamented in season with delicate lemon-yellow blossoms. The blackish bark of the woody base and branching growth-habit are little enough to remind of broadleaf or conifer; but on the cactus plains of the Date Creek Desert, scattered dwarfish stands of these six-foot "pears" perform for other living things the myriad services of trees.

The flame-flowered ocotillo, tall thorny shrub of the wastes, seems almost to attain tree-like aspect in the barren lands where it takes their place. Its useful canes, sometimes numbering more than one hundred to the clump, discard their leaves with drought, and put forth new garments of green after every thirst-quenching summer thundershower. Cahuillas of the Mojave eat both their flower and seed.

In reality a giant tree-lily, the Joshua tree is the desert's most ambitious substitute for pine or oak. For cactus woodpecker, plain titmouse, screech owl and Scott oriole it serves just as well. Anciently it helped to support the giant, yucca-feeding ground sloth. Now it shelters the little night lizard. And while Hiawatha bound his birch canoe with

larch roots, the Mojave tribes utilized the red rootlets of the Joshua to pattern their finest basketwork.

Great forests of the strange, fantastic tree-lily range the foothills of the desert mountains, marking the upper limits of the creosote-bush belt and separating it from juniper and nut pine. Its grotesque ranks march across the Southwest like some seeming relic of Carboniferous time.

Created by whatever plant form, a forest exerts incalculable influence upon soil fertility, drainage, water-table level, erosion, wildlife and the plant societies associated with it. It is plain then, that where nature has limited and even withered with heat and drought, she has compensated for her harshness in many surprising and unexpected ways. Most notable of these are the unique, indispensable and fascinating "trees" of the desert.

In reality a giant tree-lily, the Joshua is the desert's most ambitious substitute for pine or oak—and for birds serves just as well





← With clothing of rayon, shoes of wood, Japan's children indicate her dependence upon forests

Shelter is furnished by the forests—most Japanese homes are of wood and paper. Thatched roofs are common in rural areas ↓



The author, assistant professor at the Yale School of Forestry, recently returned from Japan where he was attached to the Forestry Division of the Natural Resources Section, General Headquarters of the Supreme Commander for the Allied Powers. Here is his first-hand account of the importance of Japan's forests to her future peaceful existence

JAPAN'S most immediate problem, as she struggles to rise above the ashes of ruined cities and the ignominy of shattering defeat, is to provide food, shelter, fuel and clothing to her millions of displaced or bombed-out people. And she must provide these basic requirements to existence with little or no help from the outside world.

Thus, Japan's forest resources, always important in her basic economy, become even more important. For the very existence of agricultural lands in Japan is dependent on the forests; so is the rebuilding of two million homes destroyed by fire or bombs during the war, for Japanese houses are almost entirely made of wood or wood products. With very little coal, Japan must rely upon her forests for fuel, both for heating and for industrial use; and rayon, a wood pulp product, is playing an increasingly important role in clothing the people of that defeated nation.

Fortunately, for Japan, she has the forest resources necessary to meet these urgent needs.

To visualize Japan's immediate problem more clearly, it should be brought out that while many of her cities are in ruins, the rural areas have a peaceful aspect as though war had never approached the islands. Thus, the main problems of reconstruction are centered in the urban areas. During the latter part of the war, many of the city dwellers evacuated to the country, where they lived until after V-J Day. Then there started a mass migration back to the cities—cities that were found, in many cases, to be a mass of rubble.

Postwar Japan consists of four main islands: Hokkaido, to the north; Honshu, the central island and most important; and Kyushu and Shikoku, the two smaller, southern islands. In addition there are hundreds of little islands, many of them uninhabited. The total land area of all Japan is about the same as that of Montana.

Mountain ranges cover a major part of the land area and many of the peaks reach impressive heights. The tallest and best known is Fujiyama, on the island of Honshu, towering 12,395 feet.

The mountain slopes are heavily wooded. Land classified as forest covers about 59 million acres, or 63 percent of the total land area of Japan. Not all of this is productive, of course. During the course of the nation's development some areas were devastated through improper use and by fire. As a result, there are today about seven million acres maintaining only a scrubby forest or brush cover.

The forests include many different kinds of trees such as species of *sugi* (*Cryptomeria*), hemlock, *hiba* (*Thujaopsis*), pine, fir, cypress, cedar, spruce, beech, oak, chestnut, maple, elm and ash. The character of the forests closely resembles that of certain eastern parts of the United States. The total volume of standing timber is estimated by Japanese foresters to be about 67 billion cubic feet, of which 32 bil-



.. what forests mean to Japan

By EUGENE V. ZUMWALT

lion feet are softwoods and 35 billion feet hardwoods. The estimated annual growth of timber and pulpwood stands is 685 million cubic feet.

Forest conservation has been practiced in Japan for centuries. Indeed, the Japanese were one of the earliest people to plant trees on a large scale. However, there were periods of unregulated exploitation and destruction of the forests during the feudal period and also following the overthrow of the Tokugawas in 1867. Following the Meiji Restoration the government corrected the situation by instituting good systems of forest management. Now Japan's forests are nurtured as a crop. Trees are replaced either by natural reproduction or planting.

At the present time, the first and foremost basic essential for the Japanese is food. There are 72 million people, more than half the population of the United States, living in an area smaller than the state of California—people who must be fed from crops grown on an extremely small agricultural area. This is due to the mountainous terrain which leaves less than one-fifth of the land surface suitable for cultivation. Needless to say, every acre or fraction of available land is being tilled with meticulous care. Many hillsides which were once forested have been cleared and terraced to help stem the tide of an ever-increasing demand for more food, especially rice. During the war it was necessary to convert over half the acreage previously used for mulberry trees to food crops. This will hinder resumption of Japan's silk industry as mulberry leaves are the food of the silkworms.

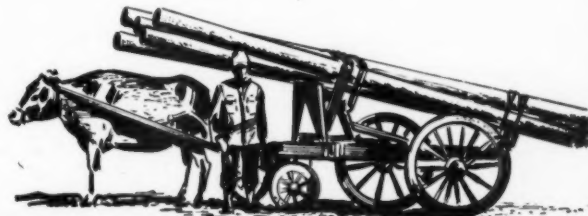
This small amount of tillable land, about 17 percent of the total area of Japan, is the life blood of the country. Over five million families—about 30 million people—are engaged in farming. The average size farm is slightly over one acre. Growing space is so valuable that areas are cropped twice

and sometimes three times a year. This is a heavy drain on the soil and requires much fertilization. Soil nutrients are partially replaced by the application of large amounts of human excreta, known as "night soil". Each evening wagons drawn by horses or oxen carrying large wooden buckets can be seen slowly winding their way from the country to the urban centers to pick up their valuable load of "night soil".

Under such conditions members of the farm households labor on their tiny plots from dawn to sunset to eke out a bare existence for themselves, and to help feed the hungry millions of the cities. The farmer's lot is a hard one, and he frequently cannot afford to eat the rice that he grows. By the time he pays his interest and taxes he may have to eat sweet potatoes and fish instead.

Forests have both a direct and indirect influence in helping with the food problem. Direct food supplies from the forest lands include wild game, nuts, berries and other fruits, mushrooms and bamboo sprouts. These represent several million yen yearly in money value. It was estimated by Japanese foresters that from September to November, 1945, over a million metric tons of acorns would be collected by school children and country folk to be used for the manufacture of flour. Over 80 percent of this would be processed by primitive means. The rest would be converted in modern mills.

The very existence of agricultural lands in Japan is dependent on the forests. The valuable farm lands at the lower





About 320 thousand tons of charcoal are used annually in the charcoal-burning power units of trucks and automobiles



Covering over half the land area of the country, Japan's forests contain about 67 billion cubic feet of timber



Lowland rice fields are protected from erosion and floods by the stabilizing influence of the mountainside forests

elevations reach up the ravines and hillsides like fingers grasping for support at the forest fringe. The topography is extremely rugged, rainfall and snow is excessive, and heavy storms accompanied by winds of great velocity are common. The combined effect of such conditions renders the land very vulnerable to accelerated erosion, unless there is heavy vegetative cover to hold and protect the soil. Even now, in spite of heavy fertilization on farm lands, there is a gradual decrease of soil fertility through soil washing. The farmlands would be destroyed by floods, erosion, or inundation by debris if it were not for the stabilizing influence of the forests on the soil of the hills above them.

Vast stretches of unbroken forest cover mantle the upper slopes of the mountains. Partial cutting of trees to insure natural reproduction is being carried on in accordance with already highly developed systems of forest management. Areas which have been clear-cut are planted artificially in order to establish immediately a forest cover as a soil protector. Over 10 million acres have been planted during the past half century. These plantings had a two-fold object: that of protecting the agricultural lands at the lower elevations and also that of furnishing a future wood supply.

The steady flow of streams and rivers which furnish year-round supplies of available water is insured by the forest cover. Irrigation of agricultural crops is a necessity during certain portions of the year, without which there would be complete crop failures. Hydroelectric power for the running of Japan's peacetime industries is dependent on an even flow of water. About 80 percent of the sawmills, vital in the production of lumber for reconstruction, are electrified.

Recognizing the importance of forests in their basic economy, the Japanese passed a National Forest Act in 1907, and amended it in 1911. The act, providing for administration and management of forest lands, includes provisions for setting aside "protection forests" to protect the soil from erosion, to protect adjacent agricultural lands, and to provide an even streamflow. About 10 percent of the total forest area of that nation has been specifically set aside for this purpose and is under the control of the Japanese Bureau of Forestry.

Thus, the forests of Japan will insure the continued operation of those vital little farm areas which produce food for the nation.

The second basic essential in Japan's present emergency period is shelter. How to house the millions of returning soldiers, civilians who evacuated from the cities and those returning from distant points of the once far-reaching empire is a problem of great magnitude in Japan today. Shelter can and is being furnished directly from her forests. Japanese houses are almost entirely made of wood and paper, the latter also being a product of the forest. Tokyo, the hub of the land, the seat of all government activities, was before the war a city with about 98 percent of its buildings made of wood. Fire, resulting from bombings, virtually destroyed all but a skeleton of the one-time metropolis which had a population of over seven million people. Similar damage resulted in the other bombed cities. The Japanese Ministry of Welfare reported that two million structures, classified as residences, were burned or destroyed in the air raids.

Efforts to house the returning people are being made by the Japanese Housing Corporation under the Welfare Administration of the Home Ministry. Small, one-story houses are being erected. These units are about 13 feet wide and 16 feet long and each accommodates one family. Erection is taking place as fast as lumber can be supplied. From 1,000 to 1,200 board feet of lumber are required for each house.

Present supplies of lumber are limited. The reasons for this may be stated as follows: many large sawmills were

damaged or destroyed by bombs; production breakdowns due to old or worn-out machinery; lack of fuel and lubricants; labor shortage around urban mills due to lack of housing and food; slow transportation of logs from the woods to the mills.

Logging methods in general are primitive. Felling, bucking and skidding are usually done by hand, though horses and small overhead cable systems are sometimes used in skidding. Logs are loaded by hand or "crosshaul" using horses or oxen. Log transportation to most of the rural mills is accomplished by horse- or ox-drawn carts. River driving and rafting to some of the larger mills is common practice. Railroads, which served for log transportation under normal conditions, are now heavily overloaded. In northern Japan sled haul is common practice during the winter months. Modern logging machinery is very limited.

One is impressed by the close utilization in the woods. Nothing is wasted. Very low stumps are left; logs are cut in ten- or twelve-foot lengths down to a three- or four-inch top; branches are bundled for fuelwood or made into charcoal near the forest area. The bark of *sugi* (*Cryptomeria*) is peeled, cut into pieces, bundled and sold for roofing material. It is claimed that a roof of this material will last ten to fifteen years. What small twigs or branches might be left in the woods are picked up by the country people and used as fuel.

There are some 7,500 sawmills scattered throughout Japan, about three-quarters of them rated at less than 30 horsepower. For the most part, they are located in the rural areas close to the timber supply. The largest mill, located at Noshiro, Akita Prefecture, has a capacity of 90,000 board feet a day. The combined mill capacity for all Japan is over three billion board feet of lumber a year.

Extremely close utilization is the rule in the mills. Very thin saws, both circular and band, are used. Boards cut to seven-sixteenths of an inch thickness are common. They are seldom trimmed on the ends. The loss in volume of a log from the standpoint of lumber is about 35 percent—25 percent from slabs and 10 percent from sawdust. Both slabs and sawdust are used for fuel either in the mill or sold on the open market. Thus, there is practically no waste in the wood volume of a log. It is common practice in small mills to saw up logs as small as four inches in diameter and six feet long.

In both small and large mills the movement of logs from the deck to the carriage, and of boards from the carriage to the yard, is done by hand labor. In most small mills even the carriage is pushed manually.

Japanese foresters estimated that about 714 million cubic feet of timber of all kinds (excluding fuelwood, but including mine timber, poles, piling, pulpwood and crossties which are not sawn) was the minimum demand for 1945. About three-quarters of this was to enter the construction field. The estimated total demand for 1946 is 1.2 billion cubic feet, excluding fuelwood. About half of this will be used for construction purposes. Thus, shelter for the homeless millions of Japan will be provided by her forests.

Due to the very limited production of coal, and this of relatively poor quality, wood from the forests is of paramount importance for heating and industrial use in Japan. Firewood may be considered as a by-product of commercial logging operations, as previously mentioned, and also as a separate product. Farmers in the off-seasons do a great deal of woodcutting on their own forest lands. Commercial woodcutters obtain permits to cut on both government and private forest lands.

Firewood is of two types: that used as wood itself and that used as charcoal. Japanese foresters estimated that the

(Turn to page 245)



A typical cutting in a 50-year old plantation. Over 10 million acres have been planted during the past half century



Hand labor is characteristic of Japanese forest operations. Large logs are loaded wholly by manpower on small cars



About 7,500 sawmills are scattered throughout Japan with a combined capacity of but three billion board feet a year

TUNNEL DWELLERS

Chambers of *Bankia*'s innerworld (left) revealed beneath the pin-holed surface of a plywood panel (right)

By L. J. PESSIN

WOOD, nature's principal product of the forest, is in constant danger of being attacked by a multitude of organisms. Decay-producing fungi and the ever-busy termite are probably the most common examples of terrestrial wood-destroying creatures.

In the water, as on land, there are also creatures which bore into wood either for protection or to use the wood for food. And while the aquatic forms are not as familiar to the layman as are the terrestrial forms, seafaring men, fishermen, boat builders and most construction engineers know of the existence of marine wood-destroying animals.

Indeed, the existence of the marine wood boring teredo was known to Theophrastus some 22 centuries ago. It is said that even Alexander the Great once sent out an expedition to seek a wood that was resistant to the teredo. What is not generally known is the extent of damage that the marine organisms can cause. Nor are the early symptoms of infestation readily recognizable. The writer has talked to boat builders who did not know how to judge the degree of

wood destruction by surface observation, and they were truly amazed when shown the labyrinth of tunnels in the interior of wood which they considered sound.

A recent study gave the writer an opportunity to observe the destruction of wood by the mollusk, *Bankia*. The study was designed to test variously-treated plywood panels by submerging them in the waters of the Gulf of Mexico and subjecting them to attack by various forms of marine life. More than 600 plywood panels were used; half of them made of mahogany, the others of black gum. The panels were exposed for periods varying from two to seven months.

The presence of *Bankia* was first noticed when the plywood panels were pulled ashore and the water was allowed to drain off. Tiny white specks were scattered over the surface of the panels. Inspection with a hand lens revealed feathery structures protruding from the tiny pinholes. These were the pallets of the animals, specialized structures designed to close the openings of the tunnels when unfavorable conditions prevail. After

the panels were allowed to dry for several days, the pinholes were more evident, but could be easily overlooked when examined superficially. Recognition of these tiny pinholes is important in determining the presence or absence of the borer in the interior of the wood. The top veneer was then ripped off and a new "world" revealed itself. Each pinhole was an opening into a tunnel, where the body of the organism was lodged.

The tunnels were many times larger in diameter than the pinholes on the surface. They varied from one-eighth to one-quarter of an inch in diameter, and up to several inches in length. Each tunnel continued in the same direction as it started, some running parallel to the grain and some across it. The glue line seemed to be no barrier; the tunnels ran right through it. Few tunnels crossed each other. In such cases, the animal in one of the tunnels was dead. Free of wood dust, the tunnels were lined with a white coating secreted by the animal.

The weight of the panels was considerably reduced by borer attack.

Panels with a moderate number of tunnels lost nearly one-third of their weight, while more seriously affected panels were less than half of their original weight. *Bankia* apparently attacked with equal vigor panels made of mahogany as well as those made of gum. Panels submerged in late summer showed evidence of attack in less than three weeks.

The importance of the recognition of early attack by *Bankia* must be emphasized. When the surface of the bottom of a boat or of bridge piling shows only a few scattered pinholes, treatment and repair may be effective and economical but, when such parts are left in water unattended, repair in boats may become expensive and affected piling may endanger lives.

Although the wood boring mollusk found most commonly at Grand Isle, Louisiana, where the tests were conducted, was *Bankia*, there is reason to believe that the well-known teredo may also be present there.

There is also an isopod, *Sphaeroma*, that causes considerable damage to boats as well as bridge piling in southern waters. This crustacean does its greatest damage in brackish water. It resembles the common "pill bug", and is often so called locally. It bores holes, about three-eighths of an inch in diameter, to a depth of an inch or so. In the lakes around New Orleans, it is known to attack cypress wood with gusto, piles and boards having been found riddled by it. However, this organism has preferences; the softer the wood the more likely it is to be attacked. Apparently working mainly between tide levels, it is found at all levels on piling.

The complete life histories of the different species of *Bankia* are still unknown but enough information is available to give one a general idea of the life and workings of this mollusk. Unlike those of the teredo, its eggs are discharged into the water where fertilization and development takes place, and the bivalve larva settles on a floating piece of wood, punctures, enters the wood and begins to bore its tunnel. Teredo eggs are fertilized internally and are retained in the gills of the female until the larvae reach a fairly advanced stage.

The breeding season of *Bankia* occurs between February and July, while the teredo breeding season extends from July to December.

Bankia is the less resistant to low salinity. It seems to thrive in a

In the water, as on land, there are wood-destroying creatures. Here are some interesting facts about marine borers and their attack on piling and ship bottoms

salinity of 25 parts per 1,000, but it can endure a salinity of 10 parts.

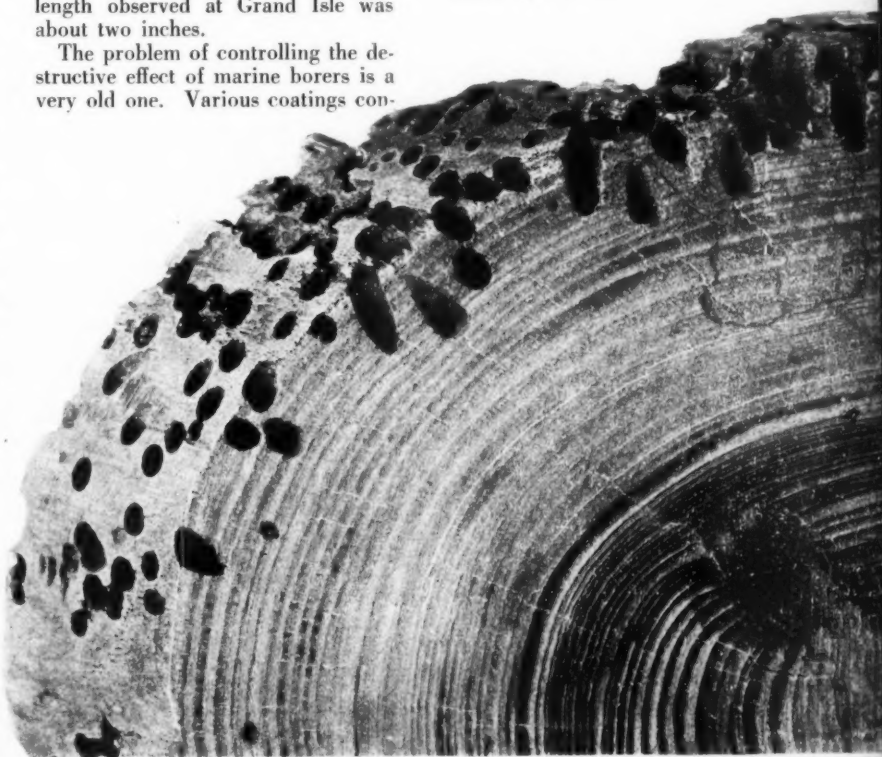
The tunnels of *Bankia* are generally larger than those of the teredo, and are less regular. The burrow enters the wood at right angles to the surface as a small pinhole, and turns obliquely downwards enlarging rapidly. Tunnels one-half inch in diameter and over 30 inches long have been reported. On piling it is known to concentrate its attack near the mud line, while attacks by teredo occur closer to the surface.

The body of *Bankia* is composed of the shell at the inner extremity of the tunnel, the feather-like pallets at the outer extremity terminating at the mouth of the tunnel, and in between the oyster-like soft body of the animal. The two siphons, one pumping in fresh water with plankton, and the other excreting undigested substances and eggs, are both located at the extremity near the pallet. It has been reported that individuals of *Bankia* sometimes reach a length of six feet or more. The maximum length observed at Grand Isle was about two inches.

The problem of controlling the destructive effect of marine borers is a very old one. Various coatings con-

taining toxic substances have been used by boat builders for many years. Such coatings varied considerably in their effectiveness against the marine borers. In most cases the toxic substance weakened through leaching or electrolysis, lost its power to repel the borers within several months.

During World War II a number of protective coatings have been developed in connection with materials built for use by the Army and the Navy. Although these coatings were superior to those on the market prior to the war, their effectiveness was good only as long as the surface of the coating remained intact. If the bottom is scratched and the surface coating is rubbed off, even for a fraction of an inch, the borer may enter and develop within the wood. In the writer's own tests, he found that an effective way of repelling marine borers is to inject the toxic substance into the wood tissues, where it can be precipitated into an insoluble salt. Plywood panels so treated showed no attack by *Bankia*.



Piling and boats are damaged by *Sphaeroma*, known as the pill bug



ONCE again, with the approach of May, the woods of Spring gleam with the white drifts of dogwood. Tier on tier the blossoms lie—a true flower at each heart. No lovelier, no more truly American tree is found among our native flowering group than the white-flowered dogwood. Known botanically as *Cornus florida*, it grows from the Atlantic Coast to the Mississippi Valley and from the Gulf of Mexico to Canada. There are about forty or fifty species in the world, all in temperate zones. A few species are found on the Pacific Coast. But it is in the East and Middle West that this hardy native comes to its full glory. When “the winter is past, the rain is over and gone, the flowers appear on the earth and the voice of the turtle is heard in our land”—the dogwoods burst into snowy bloom, flinging their veil of enchantment to the winds of Spring. . . .



DOGWOOD ENCHANTMENT

*"So joyous May the tarrying Spring would rouse
With bursts of song from snow-white dogwood boughs"*



Acclaimed as the most picturesque of all the dogwoods, this beautiful tree stands in Valley Forge Park, Pennsylvania — a veteran of the flowering tribe, nearly one hundred years old

HOW MUCH CAN BE *Harvested?*



By BURT P. KIRKLAND

LIVE timber is seldom static. It is either growing or declining in net utilizable volume. Virgin forests may appear to be static because of approximate balance between growing and declining elements. In forests fully converted to intensive management, the decadent elements present in virgin forests have been eliminated. Then all the wood volume present functions as a base to which new wood is added each year. A continual effort is made (by the forester) to adjust the volume kept on hand, or the forest growing stock, to maximum productivity—a condition where the annual growth bears a favorable relation to the permanent forest capital. In forests thus made fully productive the yearly cut and growth are closely related.

Such forests are said to be under sustained yield management; actually, of course, the management is intensive and calculated to sustain wood production at high volume and value levels. It is also possible to have sustained yield at lower levels under less intensive management.

There will always be sustained yield—of a sort—in the Douglasfir region of the Pacific Northwest. With less than 20 percent of the land suited to ordinary agricultural uses or grazing, and rough topography characterizing much of its surface, forests are sure to persist over large areas. A vital question regarding sustained yield there is whether it will eventually produce only timber in the smaller sizes and of lower quality, or yields of large high-quality material as well as great quantities of smaller stuff. Fortunately, the re-

This Douglasfir, age class from 100 to 150 years, is producing rapid growth of clear wood — but density should have been reduced much earlier

gion can still choose between these two kinds of forest management.

There can be continued logging of the larger and better growing stocks until all the old growth and large young timber shall be removed. The natural course then would be to keep on cutting everything as fast as it reaches minimum merchantable size or will barely pay its way. Thus, for future forest owners, excepting perhaps those in the pulp and paper industry, there would be produced only wood yielding the lowest possible margin for stumpage, profits and risk. Generally speaking, this procedure has been followed in New England, which formerly produced coniferous timber of as fine quality as that available in the Pacific Northwest. Such kinds of wood have long since disappeared from New England conifer forests.

At the other extreme, owners and managers may choose to conserve the larger and finer growing stock, still abundant, and to follow silvicultural and management practices that will produce more trees of this high quality, as well as vast volumes of bulk woods. For such private owners and public administrators there arises at once the question of how much timber can be cut from such managed stands while still maintaining intact their forest capital. And more broadly, for the American public the question is: how much good wood can the region contribute to our economy under such management?

Sustained yield, soundly administered, does not necessarily produce fixed quantities decade after decade. It represents a flexible relationship between condition of the forest resource and market conditions. In certain states of Central Europe, forests have been so managed that the quantity and vigor of the growing stock has improved sufficiently during the past 50 years to warrant doubling the annual cut in most forests. In some other countries the forest has deteriorated, and the cut has declined.

In the Douglasfir region, final management policies have not been firmly established, but events have developed far enough to foretell a region-wide aim of continuous high-level

Intensively managed, existing forest stands in the Pacific Northwest can sustain an annual cut greater than any previously realized in the region

timber production. It is to be hoped that such a policy, to be concurred in eventually by all timber owning interests, public and private, will seek to maintain such of the present wood-using industries as may fit a gradual change in the character of forest raw materials.

It is recognized, of course, that some sawmills have quit operations because of exhausted local timber supplies. Yet, a significant number of leaders in the lumber production field are planning their operations into the far distant future. Considerable volumes of merchantable private stumpage are so committed. Meaningful, also, is the fact that other forest industries, notably pulp and paper manufacturers, are purchasing cutover lands and even moving upon plant sites recently vacated by large sawmill companies. These leaders are setting up staffs of capable foresters with intent to be guided by them.

Far from desiring the continued operation of plants that do not fit the present technological and economic scene, a regional forest management plan may well assume that obsolete plants of whatever kind be junked at an early date. There is a considerable field open for construction of new sawmills more economical of operation, better able to cooperate with the pulp and paper industry in using slabs, and better adapted to using types of logs which will be available in the future than are many of the mills operating today.

Next to obtaining sufficient timber from the forest to main-

To stop mortality losses, this 40-year-old Douglasfir needs a thinning of 20 or more cords an acre



tain income for forest owners, management and labor, the most important objective of timber cutting in our northwestern stands is to get them into condition to yield growth equal to the annual cut. It is generally understood that mature stands are usually stagnated, because losses from decay and other causes approximate increment by growth. At present, even if growth in all stands were entirely absent this would not justify withholding cutting operations. Thus, today's comparisons of current increment, particularly in saw-timber sizes, with current cut may be more misleading than enlightening.

On the other hand, even where there is a surplus of matured timber, beyond present needs, so much should not be allotted to immediate cutting that excessive waste will result. Allowable cut, calculated with care for present and future interests of forest owners, and with regard for sound forest management, is based mainly on three considerations:

- (1) Orderly utilization of mature timber already grown, with provision for future needs.
- (2) Adequate thinnings in young stands (30 to 100 years old in Douglasfir region).
- (3) Removal of all timber utilized, whether young or old, in a manner to put residual stands into the best growing condition to increase the quantity and quality of future production from them or to replace them by prompt regeneration.

For the Douglasfir region a thoroughly reliable estimate of aggregate growth does not yet exist. Fragmentary evidence from periodic measurement of permanent sample plots and other reliable sources shows very high growth rates. Statistics of growth have been prepared by the Pacific Northwest Forest and Range Experiment Station of the U. S. Forest Service. A great deal more work must be done before there becomes available an adequate basis for a regional allowable cut. However, from the information at hand extremely interesting and useful calculations can be made.

It has been common practice to figure allowable cut by a formula based upon the amount of standing timber and the growth rate as indicated by sampling the various kinds of stand represented. On the national forests, the allowable cut is related to those stands which are accessible or are being made so by construction of road facilities. Since much of the public domain which was included in national forests lay in the mountains, it naturally happens that large areas still remain inaccessible. Some of these are regarded as non-commercial, and may never be logged, but the larger part awaits only transport systems to make their timber available for commercial use. Of course, this is true as well of other federal forests, and to a lesser extent of state and private holdings.

Time was when railway construction was the magic influence that gave commercial value to western timber. Unfortunately, the high costs of building such lines and keeping them alive often dictated harvesting policies not conducive to long-time forest management. Today other methods and machines are in use and permanent road systems are practicable, which in turn permits intensive management of stands for sustained yield at high levels.

In their approach to the task of estimating the annual cut allowable for the Douglasfir region, the federal experts calculate only the *net yearly* growth of stands under 160 years of age. Thus, they disregard the growth potential of older stands because yearly increment is offset by decay and other losses. For the Douglasfir region this net growth was estimated as of 1936 at 2,381,546,000 board feet on trees larger than fifteen and one-half inches d.b.h. or 916,465,000 cubic feet including smaller trees down to three and one-half inches d.b.h. From this it would appear that yearly saw-timber increase by growth is less than one-fourth of current regional cutting for commercial uses, and that the forest

capital is being reduced at a dangerous rate.

Actually, the Forest Service has under consideration a substantial revision upward of this estimated growth. If, as is expected, Uncle Sam's experts agree that annual saw-timber growth amounts to 3.6 billion feet, then possibly depletion is still a bit more than three times growth. However, the chief point to be made here is that net growth statistics as made for the Douglasfir region are not adequate, in themselves, to serve as a basis for computing allowable cut.

To be fully useful, growth data should present the yearly gross growth, in all kinds of stands; likewise, the mortality and other losses. Net growth then appears in the proper perspective as a result of certain natural or man-made conditions.

Among these conditions affecting net growth are decay in old timber and starvation mortality in young. In old stands a few trees become "over-ripe" each year to the point of unmerchantability, and the more decrepit among such veterans succumb to wind. Actually, of course, decay is working in many of the older trees. Similarly, insects are working in the less resistant veterans, and a few or many die each year, according to whether conditions are favorable to increasing insect populations or otherwise. The annual toll from insects and diseases affecting mature stands is estimated to be 333 board feet or more an acre.

Yet the stand containing mostly trees of mature size is adding wood each year by growth. Removal of the over-ripe and volume-losing individuals tends to stop the counterbalancing losses. Growth of smaller trees is speeded up by removal of the bigger. Thus, it is possible, by management, to obtain appreciable net growth rather quickly, even in mature stands.

On most good and moist sites these old growth stands contain 50 or more smaller hemlock and true fir trees on each acre. Expansion of the sulphite pulp industry which produces from these species the valuable dissolving pulps (for rayon and like products) and other high grade pulps is being hampered by lack of dependable supplies of these species. Selective management of old stands is the short-cut to increased production.

In young stands, countless trees die of starvation, while the stronger and better situated survive. Permanent sample plots in the Douglasfir type, established and measured periodically by the Pacific Northwest Forest Experiment Station, some since 1910, show the following average results for different sites. (All plots were nearly fully stocked; ages within the measurement periods range from 24 to 110 years, but most fall between 40 and 90; averages given cover periodic growth per growth year, including all ages in the plots.)

Sites	No. of Plots	No. of Growth Years	Periodic Gross Growth (Cubic Feet)	Annual Mortality (Cubic Feet)	Net Growth (Cubic Feet)
I*	4	60	242	336	-94
II	13	265	291	72	219
III	18	297	211	58	153
IV	11	136	202	51	151
V	1	10	212	35	177

*Half of the Site I plots suffered serious windfall during the period of measurement and do not represent average conditions.

Excepting the Site I plots, average mortality on all sites was close to one-fourth the gross growth. This is ample evidence that no more than three-fourths of the potential yield can be obtained in unmanaged stands. For the best results, periodic thinnings must remove much more than one-fourth the current growth.

In untended stands this process of selection goes on so
(Turn to page 230)

Lilian Cromelin

RETIRES

Associate Editor of AMERICAN FORESTS rounds out forty years of loyal and inspirational service to the cause of forest conservation

IN THE magazine business we don't write about ourselves. The story is always about the other person. But at rare intervals someone stands out who by achievement and unfaltering devotion to an ideal knocks this rule into a cocked hat. Such is the case of Lilian Cromelin, associate editor of AMERICAN FORESTS and for close to half a century an untiring missionary in the field of conservation.

Lilian Cromelin will retire on May 3, exactly 40 years to the day from the time she first took up the fight for the forests of America as a member of the staff of The American Forestry Association. Or perhaps it should be written that she will close the book on layouts and proof, pastedowns and deadlines, for it is impossible to imagine Lilian Cromelin ever retiring her deep-rooted convictions and the gifted talents she has devoted to the advancement of forest conservation these many years. Just as the cause for which the Association stands has been the first and abiding interest of her life, so will it continue to be. This is characteristic of Lilian Cromelin—this admirable sense of loyalty to the humankind she serves.

To catalogue even her most noteworthy contributions is impossible here. They are too numerous. The planting of a "Mother's Tree", nationalized by the Association, is very close to her heart and her untiring efforts in its behalf have spread this beautiful Mothers' Day custom throughout the land and endeared her to thousands. Always quick to recognize greatness, she is mainly responsible for the creation and development of the Association's "Hall of Fame for Trees" in which is recorded for posterity great trees associated with great men and events in American history.

But it is primarily to AMERICAN FORESTS that she has dedicated her keen feeling and perception of the beauty and charm of the forests and outdoors, as well as her knowledge of basic needs. Since 1918 when she changed over from

Association administrative work to become assistant editor of the magazine, she has held steadfast to her belief that the hearts of mankind unfailingly respond to the sparkling stream of beauty that flows from the forest or that is inherent in individual trees. Yet she has always been mindful that a better material world can be built for her fellow men by intelligent utilization of the many and varied products of the forest—that this is possible through intelligent forest management that preserves the spiritual beauty and humanitarian services of our woodlands.

Educated at Visitation Convent in Washington, Lilian Cromelin took up her work with the Association in 1906 under the leadership of Thomas Elmer Will, former president of Kansas State Agricultural College. She continued in administrative work under executive secretaries Edwin A. Start and Percival S. Ridsdale, changing over to editorial work during World War I to relieve Mr. Ridsdale for activities with the National War Garden Commission. Serving first as assistant editor, she became an associate editor in 1938.

Through the four decades she has dedicated to the work of the Association, Lilian Cromelin has lived by her faith in its objective—the bringing about of greater appreciation and better handling of the forests of our country. And it is characteristic of her great and unselfish spirit that her richest reward comes from having had a vital part in this high endeavor.

In her own words, recently spoken in a reflective moment, "My pride in the Association's accomplishments is inexpressible. To have had ever so small a part in its work has brought the deepest satisfaction, and out of my contacts with its directing officers and the members of its staff have come my sweetest experiences and friendships."

A salute to Lilian Cromelin!



LUMBERJACK

Tune Detective

By WILLIAM J. DUCHAINE

WHEN Dr. E. C. Beck of Mt. Pleasant, Michigan, goes into the woods, he hunts for an unusual sort of game—the old time ballads of the shanty boys, the rousing songs of the rivermen and other lumberjack lore.

As methodically as a G-man, Dr. Beck will track down a piece of woods lore to its source. For 15 years, this energetic but painstaking professor of English at the Central Michigan College of Education has spent his summer vacations visiting lumber camps and sawmill towns from New England to the Pacific Northwest.

Oddly enough, the northwoods tune detective did not have a lumbering background when he started his work. He was born in Nebraska, and in his youth worked as a cowhand in Montana, where he developed a keen interest in the ballads of the western range country.

Before coming to Michigan, Dr. Beck had collected many original cowboy songs, and it was not long after he began teaching at Mt. Pleasant that Michigan folks began urging him to dig the unwritten lumberjack ballads out of the memories of old-time woodsmen still living in the region.

He finally assented, but he did more than collect woods lore. He also organized a unique group of old-time lumberjacks, who have toured the country giving demonstrations of the vocal and instrumental music of the American woodsmen.

In 1941, the University of Michigan Press published Dr. Beck's collection, entitled "Songs of the Michigan Lumberjacks". Before the book went to press, he visited Maine to see what the songs were like before the Bangor "tigers" came to the Saginaw Valley, and then he went to the Northwest to see what happened after the "boys" moved from the Lake States to cut big timber in Washington and Oregon.

"I would say that many Great Lakes region songs were revised Maine songs and that little happened to the balladry of the woods after the lumberjacks went to the Northwest," Dr. Beck explains.

"Digging out the songs takes time and patience. There are many false leads for every ballad. But there are a few old-timers with marvelous memories who are depositories of shanty boy songs and verse."

Many of the lumberjack tunes are from old Scotch, English and Irish songs, Dr. Beck has discovered.



Dr. E. C. Beck

In the early eighties, white pine was king in Michigan. Whether in the Saginaw, Muskegon, Menominee, or other valleys, the lumberjacks went into the woods in the fall and did not come out until the spring drive. Between mess and bedtime those many winter nights, the jacks would sit around a hot stove repairing clothes, playing cards, telling tall tales, singing songs, dancing buck-and-wing or stag, and otherwise entertaining themselves.

In 1933, when Michigan decided to send a group of lumberjacks to represent the state at the first National Folk Festival at St. Louis, the late Constance Rourke, of Grand Rapids River, and Dr. Beck held a state festival at Central Michigan College and selected the men to compete with the folk song and

dance groups from other sections of America.

These old lumberjacks, all veterans with the ax, saw and canthook, went to St. Louis and have been together ever since, with some additions and the inevitable subtractions. They have appeared at the folk festivals held later in Chicago, Chattanooga, Washington and Philadelphia. They have furnished shanty-boy music and tales at the national lumberjacks' roleos at Escanaba and Gladstone, Michigan, sportsmen's show and national conventions. They have sung over national radio networks.

One of the striking features of the old-time lumber camp was the popularity of the fiddle as a musical instrument.

"In the cow camps I visited there were few, if any, fiddles," Dr. Beck says. "The cattle culture which came to us originated from below the Rio Grande. There, the *vaquero* strums his instrument. But the lumber camps boasted many fiddles—some good ones. In the shanties of Wisconsin, Michigan and Maine, the fiddler was always welcome.

In his Michigan lumberjacks orchestra, Dr. Beck has had some cracker-jack fiddlers, such as Carl Lathrop of Pleasant Valley, Harry Blackman of Breckenridge, Kelly Rogers of

The unique hobby of Dr. E. C. Beck, Michigan English professor, is to track down the unwritten ballads of American woodsmen

Alden, Benno Hoffmeyer of Wheeler, Foxy Grandpa Hufford of Bethany, and Ernie Losey of Alma.

"True, there were those who strummed their fiddles once in a while. And there were dulcimers, too. All the dulcimer players I have known made their own instruments."

The first dulcimer player with the Michigan lumberjacks was Cricket Mulford of St. Louis. Mulford hopped around his upright dulcimer with the agility of youth; he was colorful and always popular with his audiences. When Mulford went on his "last drive", he was succeeded by lean and lanky Bones Rouse, of Wheeler, Michigan, an outstanding solo player. Rouse, too, is now dead. Jay Mudge, of Kewadin, took his place.

A star as a novelty player on bones, spoons, needles, kegs and other lumber camp paraphernalia, is the scintillating octogenarian, Perry Allen, of Shepherd. Besides, at 86, Perry is one of the best dancers among the shantyboys of America. Other octogenarian dancers who can shake a mean hoof are Bill McBride, Cal Thomas and Frank Hufford, all old-time woodsmen.

A good many of the shanty boys' songs were mournful dirges, reflecting the loneliness of many months of working, eating and sleeping in isolated lumber camps. For instance, there is the ballad, "A Shantyman's Life", which Dr. Beck picked up in Michigan, Wisconsin and others parts of the country. It reads in part:

A shanty man's life is a drearish life,
Though sometimes 'tis free from all care.
'Tis swinging an ax from morning till night
In the midst of the forest so drear
'Tis swinging an ax from morning till night
In the midst of the forest so drear.

Frank Hufford, of Bethany, gave Dr. Beck the following version of "Louie Sands and Jim McGee" (Louis Sands, a Michigan lumberman of Scandinavian descent, operated extensively in the Manistee country, along with Irishman Jim McGee), sung to the tune of "Beulah Land":

Who feeds us beans? Who feeds us tea?
Louie Sands and Jim McGee.
Who thinks that meat's a luxury?
Louie Sands and Jim McGee.
We make the big trees fall ker-splash
And hit the ground an awful smash;
And for the logs who gets the cash?
Louie Sands and Jim McGee.

Other verses display the lumberjacks' contempt for the constant repetition of beans on the camp bill-of-fare.

The river drive is the subject for many a northwoods ballad. Dr. Beck says the following version of "The Drive" came from James Loomis, of Hobart:

The stony brook is foaming
Where the boulders show their teeth,
Just wanting for a chance to start a jam:
There is white water a-combing
On the granite underneath;
There's a lovely chance for trouble at the dam.
They will sluice her just at daylight,
And they'll let a million through;
They will ram her full of timber to the brim,
They will sluice her in the gray light,
And there'll be some work to do
For the foreman and the boys along with him.

The lumberjacks also sang of love, and here is a Michigan version of "Bung Yer Eye", furnished Dr. Beck by George Andrews, of Arcadia:

(Turn to page 244)



Bill McBride, the 80-year-old singing woodsman



These old-timers helped popularize lumberjack lore



TEN YEARS IN GEORGIA PINE

By B. F. GRANT and A. E. PATTERSON



This article previews the findings in Georgia of the Forest Resource Appraisal of The American Forestry Association. Texas and Ohio will be presented in the May issue.

ONE hundred acres of pine land for \$6.75! That was the price in Georgia in 1806. The Georgia legislature, meeting in 1803, had passed an act to dispose of lands acquired from the Creek Indians by the treaty of June 16, 1802. The territory obtained lay south of the Oconee and Altamaha rivers, and included what now constitutes some 16 counties in the lower Piedmont and coastal plains section of the state. To provide a fair and unbiased distribution of the lands among Georgia citizens, the legislature decided upon disposal by lottery, resulting in what is now known as the "Lottery of 1806".

Rules of the lottery were simple. Any male citizen having the requisite registration fee of twelve and one-half cents could register and receive a ticket. Fortunate ticket holders were issued grants on payment of \$9 a hundred acres for first quality river bottoms; \$7 a hundred acres for first quality high lands (those lands where hardwoods predominated in the forest cover); and fifty cents a hundred acres, plus six and one-quarter cents an acre within five years from the date of granting, for pine lands.

It is further recorded: "... pine barrens are unfit for agricultural purposes after they are cleared, and the timber is of no value."

Today, 140 years later, these "cheap" pine lands constitute Georgia's greatest natural resource, a resource having incalculable potentialities for this state. To think of timber in Georgia is to think of pine, for pines either predominate or are mixed with hardwoods on 20 million of Georgia's 25 million acres of forest land. These pine lands contribute annually nearly two-thirds of the United States' and one-half of the world's production of naval stores; approximately five percent of the United States' lumber production; over a million cords of pulpwood; and a tremendous supply of fuelwood, poles, crossties, mine props, posts and many other products. Beyond all doubt, Georgia is a "timber" state; supposedly it becomes more so with each passing year.

Georgians, however, wanted the facts. As a result, in 1944-45, the Agricultural and Industrial Development Board of Georgia joined forces with The American Forestry Association, the Georgia Department of Forestry and the Georgia Forestry Association to conduct a survey of the forest resources of the state. Unlike former surveys in Georgia, this study was made on the county level so the results would be useful to local interests and industries. These results have now been published for groups of counties corresponding to Georgia Department of Forestry districts (see map), with the forest facts for each county itemized. Incidentally, the forestry districts are identical with Georgia Congressional districts, with the exception of District 9, which includes Congressional districts 5 and 9.

Georgia is a state large in area and varying in physical appearance. Down from the mountains in the north, across the rolling Piedmont Plateau and the flat reaches of the coastal plains to the sea, Georgia's topography presents a constantly changing panorama. And there comes also a change in forest cover, a gradual transition that defies accurate demarcation.

District 7, in the northwestern corner of the state, consists of limestone valleys and upland provinces. The topography is rolling to fairly rugged, with shortleaf and lob-

At left—slash pine and Harriet, both four years old. Below—this 20-year-old slash pine plantation has been thinned, producing pulpwood and improving growth





Devastated area in the Piedmont. Nothing can be said in support of this kind of operation



This simple wheeled falling and bucking saw has revolutionized tree harvesting in the South

lolly pine and the oaks, hickories and yellow poplar constituting the major portion of the forest cover. Directly east, is District 9, including the Appalachian Mountains and part of the Piedmont Plateau provinces. The former is extremely rugged, the latter, rolling. Forest growth in this district is primarily the same as in District 7, with excellent stands of oaks and yellow poplar predominating in the area.

Districts 4 and 10, and the northern part of District 6, are confined to the Piedmont Plateau. This is the land notable in Georgia's agricultural history. Here were the fabulous ante-bellum plantations, and few are the acres that have not at one time been under the plow. Still regarded as traditionally agricultural, much of the acreage formerly under cultivation has nevertheless reverted to forest. Tens of thousands of acres unable to compete with modern methods of cultivation which demand good soil have been thrown out of cultivation, but not out of production, for these acres have immediately seeded in to loblolly, the pine so aptly termed "old-field" pine.

In many stands, shortleaf pine is found in mixture with the loblolly, and along all streams there are narrow belts of hardwoods. Such stands, together with the thousands of acres of pine plantations are the Piedmont's present source and future hope of forest products and forest income. Much of the timber, as its origin would indicate, occurs in relatively small tracts, interspersed with cultivated land and improved pastures. Growth in this area, particularly in the lower Piedmont, is phenomenal for individual trees and probably greater than in other parts of the state, but because of fewer stems an acre it is not as good on a per-acre basis as in the coastal plains.

Districts 1, 2, 3, 8 and the southern part of 6, lie in the Atlantic and Gulf coastal plains, and are separated from the Piedmont by the shore line of an ancient ocean, commonly referred to as the fall line. This vast area of 14 million acres is the undisputed home of the longleaf and slash pines, the world's greatest source of naval stores. True, a considerable amount of loblolly pine grows in the area, and valuable hardwoods such as red gum, tupelo gum, black gum and yellow poplar are found along with cypress in areas generally conceded as too wet for pines, but it is the "piney woods" that hold undisputed claim to most of the area. Given fire protection, reproduction in this area is assured; growth is fast, and timber stands produce three crops instead of one: pulpwood from thinnings; later, gum for naval stores; and, finally, poles, piling and timber from the mature trees. This is the forester's dream of efficient timber production.

Previous to 1936, little was known about the extent of

forest resources in Georgia. Guesses had been made from time to time, but no accurate estimation had been attempted until 1936, when the U.S. Forest Service through its Southern Forest Experiment Station completed a forest survey of the state. Results of that survey showed a volume of 32 billion board feet of pine, and 13.5 billion board feet of hardwood and cypress sawtimber in the state. Complementing this were 36 million cords of pine and 44 million cords of hardwood and cypress in trees smaller than sawtimber size. This total volume, plus reproduction-size trees, was reported to be standing on 21.4 million acres of forest land.

What has happened to the timber lands in Georgia since the survey of 1936 was made? Have the lands been devastated? Have wild fires burned all remaining timber down to the smallest seedling? Has cutting by "timber barons" been rampagous and heedless of Georgia's future supply of timber?

The Georgia Forest Resource Appraisal of 1944-45 answers these questions. There are now in Georgia 30 billion board feet of pine and 9.5 billion board feet of hardwood and cypress sawtimber. Obviously, this is less than was here 10 years ago, yet there are other factors to consider. Billions of feet of timber listed by the 1936 survey were financially-mature trees ready for cutting. Georgia contributed abundantly to the volume of lumber needed for the recent war effort. Because forest products were needed during this period, trees were cut which were not mature.

Considering these factors it was to be expected that the volume of sawtimber would show a decrease, yet there is a brighter side to the picture. In 10 years, Georgia's pine cordwood supply has increased by four million cords, to total 45.5 million cords—all this during a period of tremendous and increased drain on the supply due to the establishment of new, and enlargement of existing, pulp mills. These data are of even greater significance when it is realized that these cordwood stands are the sawtimber of the future. In addition to these factors of volume, the forest land area has increased from 21.4 million to 25 million acres, until today *two out of every three acres in Georgia are forest land.*

The state as a whole is in a potentially better forest condition now than it was 10 years ago. Such is not the case, however, for certain sections. The largest decrease in sawtimber has taken place in the Piedmont, and can be attributed to the occurrence of the timber in small tracts of even-aged stands which are usually clear-cut when mature. The growing stock in this section has been badly depleted, especially during the war years, and is in need of re-building. Too often fire protection, forest management and forest education have been neglected, while efforts in these



fields have been more strongly directed to the larger holdings in the coastal plains. Piedmont forest owners, by and large, have not taken much interest or demanded the public services that are available from government agencies. Foresters on public payrolls have shown somewhat the same attitude and have tended to expend most of their energies upon the larger blocks of timber farther south. The result is that lands owned by the larger lumber companies and only a small part of those owned by farmers and business men are being properly managed.

In the northern part of the Piedmont, the pine stands are reverting to hardwoods which are frowned upon by landowners, sawmill operators and foresters alike, and with good reason. In general, the hardwoods are of inferior species and poor quality, and they grow less rapidly than the pine. It is encouraging that an effort is being made now to solve this problem, and to produce a method of maintaining the more desirable pine.

More than all else, the Piedmont is in need of an educa-

tional program in forestry which will lead to better cutting practices, a planting program for the denuded areas, fire protection, especially of young stands, and utilization of cordwood size hardwoods. No such program is possible so long as professional foresters retain their somnolent attitude toward this portion of the state.

A different situation exists in the coastal plains of Georgia. Forests are found principally in larger blocks and larger holdings than in the Piedmont, and thus are susceptible of better management. In addition, the people as a whole, landowners and others, take pride and interest in the forest, for in the flatwoods timber is a money crop and few owners will stand for it to be butchered. The trend in managing mature timber is toward cutting only worked-out turpentine trees and those other species of pine which do not produce naval stores. In younger stands cutting is confined to thinnings. Of course, there are exceptions, but overall forestry is well established and the results are evident: *the volume of pine* (Turn to page 232)

Plans For An American Forest Congress Announced

Organization plans for the American Forest Congress, to be held in Washington, D. C., October 9, 10 and 11, are now in course of completion. Called by The American Forestry Association, the Congress will be in the nature of a national "town meeting" conducted on the democratic principles of open and free discussion.

The main objects of the Congress as already announced are:

(1) To inform the American people regarding the postwar situation existing in respect to the forest resources of the United States, as thrown into relief by the results of the Association's Forest Resource Appraisal;

(2) To bring together representatives of government, industry, agriculture, labor and the public for joint consideration of the forest situation; and,

(3) To aid in the formulation of action programs which appraisal results show to be necessary to meet the country's future requirements for forests and products of the forest.

Plans for the Congress are being worked out according to the following pattern which is based upon completion of the three-year Appraisal Project by mid-summer:

(1) The Congress will be open to the public and the public will be invited to attend. Specifically all important groups and organizations directly concerned in maintenance and development of forest resources and forest land will be invited to name representatives to the Congress who may speak and submit statements for their respective groups or organizations;

(2) Later this spring the Board of Directors of The American Forestry Association will appoint a Forest Program Committee for the Congress. Members of this committee will be drawn from the best informed men available in the major fields of forest interests and thus will be widely representative of the whole field of the nation's forest economy;

(3) The Forest Program Committee will be asked to meet during the latter part of July to review and study appraisal findings and to formulate and propose a tentative forest program to be submitted to the Congress for consideration and discussion. During the Congress time will be allotted

for the submission and discussion of such other programs as other groups may wish to propose;

(4) Adoption by The American Forestry Association of the program suggested in whole or in part by the Forest Program Committee or by any other group will be subject to later revision after having had the benefit of the discussions, suggestions and criticisms flowing out of the Congress;

(5) Appraisal findings in summary form, together with the tentative forest program proposed by the Forest Program Committee, will be made public about August 1 and copies will be furnished all those who wish to participate in the Congress. Congress discussions will necessarily be subject to time limitations and speakers will be required to identify themselves and whether or not they speak individually or for a specified group or organization.

(6) On the evening of October 10 an American Forest Congress banquet will be held at the Statler Hotel, Washington.

Participation in the Congress, the Association points out, does not commit any group or organization to formal adoption of a forest program, or programs, yet it is hoped that through open discussions of specific proposals a meeting of minds will be arrived at that will unify and speed action in bringing the nation's 625,000,000 acres of forest lands into full productivity.

As respects The American Forestry Association, its Board of Directors, following the Congress, will review and consider the discussions, suggestions and criticisms resulting from the meeting and will then recommend to its membership a definite program for adoption by referendum vote of its members. It is hoped that other organizations may likewise define their positions.

In view of the fact that indications already promise a large attendance at the Congress, those who plan to be present are urged to make hotel reservations at an early date. The Association has reserved 185 rooms (of which 120 are twin-bed rooms) at Washington hotels and these are available as long as they last. Reservation requests should be addressed to The Committee on Arrangements, The American Forest Congress, 919 17th Street, N. W., Washington 6, D. C.

SUBURBAN WILDERNESS

By

HENRY S. KERNAN



This article previews the findings in New Jersey of the Forest Resource Appraisal of The American Forestry Association. Texas and Ohio will be presented in the May issue.

FIFTEEN million city-dwellers live within a few hours' drive of New Jersey's two and a third million acres of forest. However, two-thirds of these people dwell outside her boundaries. To the state's traditional role of highway between New York and Philadelphia has been added that of host to the millions who swarm across the Hudson and the Delaware, vacation-bound. Although the Pine Barrens are often called a wilderness, and Sussex County is declared to possess an unspoiled natural beauty, there is scarcely an acre of that forest that does not bear the stamp of a city-bred, industrialized population, whose yearnings, emotions and attitudes are determining its future.

View of Pequest Valley from Jenny Jump State Forest. Note that field and forest are about equal





Many valleys in New Jersey are flooded by lakes—and these are used intensively for recreation

New Jersey is called the "Garden State", but gardens alone do not satisfy the yearnings of her own people or their tourist guests. Valleys are flooded for lake sites and swamps are drained for homes. Land is cleared by one generation and abandoned by the next. Streams are stocked and streams are polluted. Native trees are cut away and exotics are planted. Cabins on the Stokes State Forest rent two years in advance; and 10,000 acres a year are burned over by the careless hand of man, who has been taught to love nature, but not to protect her. The supreme irony is perhaps the omnipresent billboard, begging the pleasure-bound traveler to pause and enjoy an unsullied landscape.

Too few look searchingly and thoughtfully behind that billboard. Those who do see a forest whose pristine grandeur has gone forever, but whose charm and variety 300 years of exploitation have not ruined. They see a forest struggling to supply the demands made upon it for timber, recreation and water by an impatient and thoughtless public.

New Jersey, smaller than all but three states, is a bulging peninsula, lying between the Atlantic Ocean and the Delaware River, and connected with New York by only 50 miles of common land frontier. It is sharply divided by a fall line running between Trenton and Perth Amboy.

South of the fall line is the coastal plain. This section supports only two metropolitan areas, Camden and Atlantic City. Limited areas of good agricultural land are found in the northern part and along the Delaware River, but the great bulk of it—1,300,000 acres—is that sandy wasteland known as the Pine Barrens. There can be no doubt that originally they were well-timbered, and were cut clean to supply an iron industry which reached its peak about 90 years ago. Whether they will ever again grow timber passably good in comparison with other regions is still a question.

There is no question about their present deplorable state. Man-caused fires have swept over them again and again, sterilizing the soil, reducing the hardwoods to wretched scrub and the pine to seared and scattered remnants. The last stages of forest degradation are seen on the "plains," an area of 15,000 acres of waist-high hopeless scrub which edges into the pine lands a little more each year.

Admittedly the chief conservation problem in New Jersey is that of fire in the Pine Barrens. Despite the most strenu-

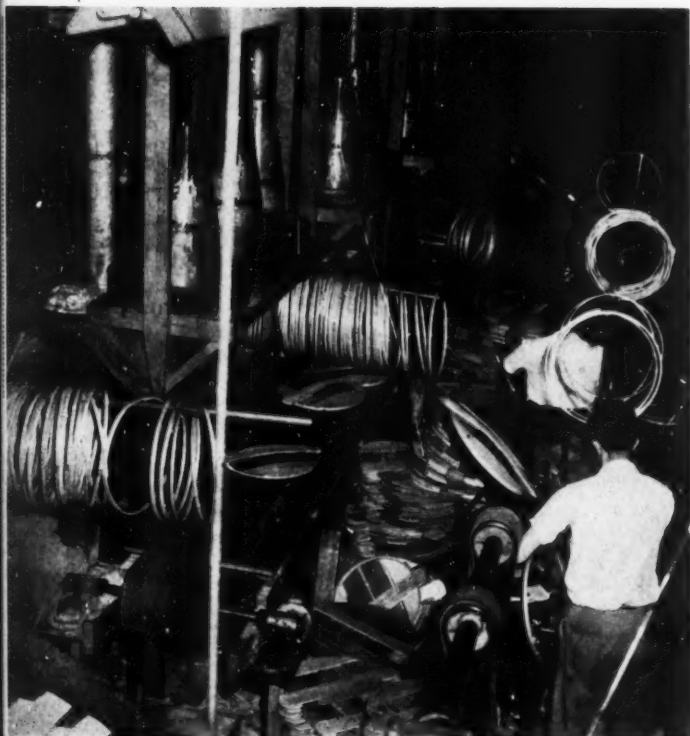
ous efforts of the state fire wardens, some 8,000 acres burned over last year. The causes are not far to seek. One spark from a railroad, a smoker, or a brush-burner and a fire may be off at the rate of a mile in 15 minutes. The weather hazard, in contrast to other parts of the state, exists all year round. A low, brushy forest underlain by quick-drying sands is highly inflammable; and the lack of fire-halting roads makes much of the land inaccessible to fire crews.

Even after the fire problem is under control, the possibilities of growing timber, while real, will still be below those of other regions. The soils are too poor to produce good hardwoods; and the white cedar, although an extremely valuable tree for shingles, posts and poles, is limited to the swampy south Jersey "sponges and cripples." Some shortleaf and Virginia pine do exist, but the timber harvest will depend mainly upon the pitch pine.

This species grows moderately in rather open stands and produces a hard, heavy wood, suitable for pulp, timbers and general lumber. It seeds well and is remarkably resistant to fire. Otherwise, it would have disappeared from the Pine Barrens long ago. A fully stocked acre grows one-third of a cord each year, and about 100 board feet of sawtimber.

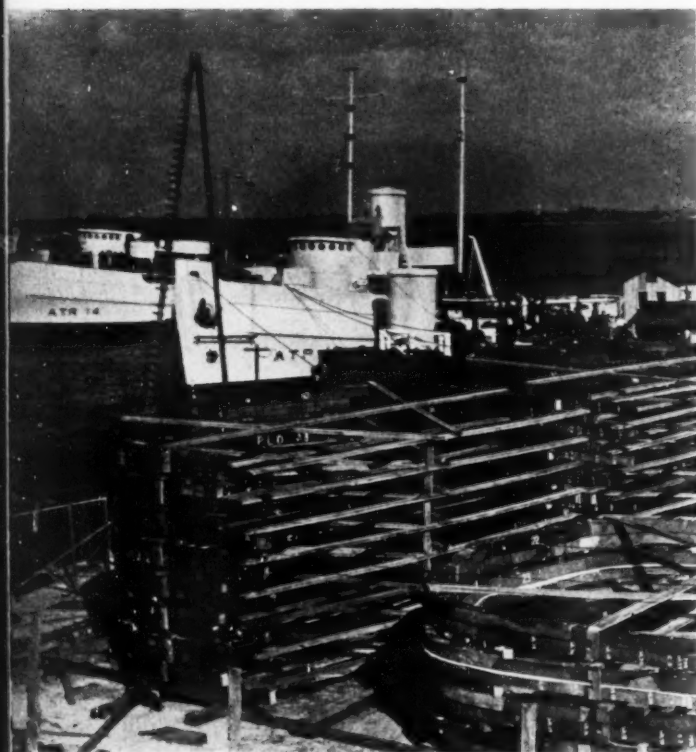
Once the iron industry had moved out, nothing comparable took its place. Thus one-quarter of the state supports a scattered population of "pineys", whose picturesque activities, such as charcoaling and gathering pine cones and moss, barely keep them alive. The cranberry and blueberry industries, while important locally, are narrowly limited by soil requirements. Their combined acreage amounts to around 6,000 acres.

The direct result is that one-third of the land is tax-delinquent and huge areas are an utterly neglected waste. State ownership probably is the only answer, and a beginning has been made with the 43,500 acres in state forests, while 40,000 more tax-delinquent acres are in the process of reversion. However, acquisition proceeds slowly, because public interest is primarily in recreation; and in this regard, the Pine Barrens are less generously endowed than other sections. Lake sites are scarce and the scenery is, on the whole, monotonous and dreary. Although intensively hunted, the Pine Barrens are not first-rate game country. In short, they present one of the most serious challenges in land use on the Atlantic seaboard.



To supply truck farmers, a basket-making industry exists in the southern part of the state

At Leesburg, on the Maurice River, 1,200-ton naval rescue tugs were built entirely of wood



North and west of the fall line are three parallel formations, known as the Piedmont Plain, the Appalachian Highlands and the Appalachian Valley. The first two are divided into glaciated and unglaciated halves. North of the glacial moraine, the soils are poorer and the scenery more spectacular, while the proportion of forest land is more than double.

To the millions who travel the main line every year between New York and Philadelphia, the Piedmont is New Jersey. This is the New Jersey of the factories and the factory towns; of the miles of suburban homes, freightyards and dockyards of an industrialized and densely populated state. Actually, the southern part contains some excellent farmland and has been extensively cleared, except for such trap-rock outcrops as the Watchungs and Sourland mountains where originally some of the finest forests stood. The northern half, while nearly one-third forested, includes the metropolitan district and is too much subject to suburban development to be counted upon seriously as a forest resource.

The Highlands rise behind Morristown and the scenery changes abruptly from a rolling plain to sharp ridges, lakes and swift streams. The northern part is heavily forested; while in the south there are many farms and estates. Washington literally had his back to a mountain wall when he camped the Continental Army two winters at Morristown.

The Appalachian Valley is entirely glaciated and general farming has long been abandoned in favor of dairying. It ends in the long, heavily forested Kittatinny Ridge, which rises to spectacular heights at High Point in the extreme northwest. Beyond is the Delaware River and Pennsylvania.

Except for the Hackensack Meadows, northern New Jersey was once entirely forested. It was essentially an oak-chestnut type, with admixtures of yellow poplar, ash, maple and hickory. In the northern part were considerable quantities of hemlock and white pine, with some white cedar and larch in the swamps. Probably the best stands in this part of the state were on the red shale soils of the southern Piedmont.

A frontier until after the French and Indian Wars, this section was developed first for its minerals. Franklin, for example, has been a mining town since the 18th century and is still the country's largest producer of zinc.

Since then the forest has been profoundly modified. The chestnut has nearly disappeared. Sprouts are still common, and woodsmen say they are getting larger and harder to kill; but the blight remains the greatest single tragedy of these as well as most other eastern woods.

Careless logging has caused a decrease in the conifers and desirable hardwoods. Gray birch, fire cherry, sassafras and red maple grow on lands that once supported oak and ash. Finally, as a result of both logging and fire, the forest is now largely of sprout origin. Such sprouts are notoriously of poorer quality than the seedlings whose place they take.

The poor condition of some forest land has, however, nothing to do with either fire or lumbering. In contrast with the southern part of the state, the forest area in the north has increased 230 thousand acres since 1895. An additional 440 thousand acres of abandoned fields are seeding to worthless species as the first stage in forest succession. Also, many swamps are a natural tangle of red maple and alder which no intensity of forestry could quickly change or improve; and on the exposed glaciated ridges, there is a chestnut oak type, whose scattered and crooked trees are all that can be expected of the thin, rocky soil.

Of the approximately 740 thousand acres in the hardwood type, including a strip along the lower Delaware, about 330 thousand acres offer good opportunities for the practice of forestry because of accessibility and volume of stand-

ing timber. Following the logic of putting the best effort where it pays most, the state has established a free marking service in cooperation with the federal government.

Upon the application of any woodland owner, a reconnaissance survey is made to determine whether enough volume is present to warrant a timber sale. The next step is to cruise the sale area 100 percent and then mark the trees to be cut. Usually, between 40 and 50 percent of the stand is so designated. The objectives in marking are to provide sufficient volume to attract an operator and at the same time take out the poorer trees, encourage reproduction of the better species, and lay the foundation for a permanent management policy. The cost of this service averages \$1.05 an acre. This is low indeed, considering that the sound timber trees standing in the woods on an average acre sell for \$45.

The information is then turned over to a timber agent, not a public employee, who, for a 10 percent fee, arranges all the details of the sale. He finds a buyer, accepts bids, sees that both sides fulfill the contract, scales all the logs, and makes the final inspection of the logged area. In this way, the state covers about 1,000 acres out of the 4,000 that are logged each year. Approval on the part of the owners has been unanimous and more requests are made than can be handled. The loggers have often been irked at having to pay higher prices and leave merchantable trees, but they are coming to realize the advantages of buying known quantities of timber without having to scout for it themselves.

The kind of management which a tract of woodland receives often depends upon the type of ownership. Estates and semi-private institutions are usually conservative. The 53,000 acres held by water companies, for example, are receiving excellent care. Of the operable timberlands, 43

(Turn to page 248)



There is still big hardwood timber in Jersey

Beginnings of a state forest in the Pine Barrens—fire protection roads, first step in rehabilitation



KNOWING YOUR TREES

OREGON ASH

Fraxinus oregona, Nuttall

By WARREN D. BRUSH

TRAVELERS in western Oregon and Washington often notice pure stands of Oregon ash in its preferred habitat on poorly-drained, moist, bottomlands in the innumerable valleys west of the Cascades. Here it follows streams and swamps in ribbon-like fringes. It is also found on sandy, gravelly or even rocky soils in old fields and along roadsides in mixture with bigleaf maple, red alder, lowland white fir and Douglasfir.

Most abundant in the Willamette Valley of Oregon, this tree ranges from Puget Sound to San Diego west of the Cascades, and from sea level to 3,000 feet elevation.

Oregon ash belongs to the olive family, whose nearly 500 species of

trees and shrubs are widely distributed throughout the northern hemisphere and south of the equator in Java. Besides the edible olive, this family includes the lilacs, the forsythias, and the privets.

Of over 40 ashes in the world, 18, of which five or six reach commercial size, are found within the United States. Oregon ash is the only timber ash of the Pacific region.

It is a medium-sized tree from 60 to 80 feet high and from 24 to 36 inches in diameter at maturity. Under the most favorable conditions, it may become twice as large and reach an age of from 200 to 250 years. Trees grown in the open have short trunks and wide-spreading branches; where-

as those found in the forest have long, clean trunks and compact crowns. On dry sites, they are stunted and twisted.

The bark, one to one-and-a-half inches thick, is dark gray-brown, with an interwoven pattern of flat ridges and diamond-shaped fissures — on very old trees slightly scaly along the ridges.

The leaves, as those of all ashes, appear late in the spring and drop early in the fall after turning a yellow or russet brown. They are pinnately compound with five or seven leaflets, yellowish green above, paler and downy on the under side. The leaflets are three to seven inches long, and from one to one and a half inches



A medium-sized tree, the Oregon Ash has a short trunk and wide spreading branches when grown in the open. The leaves appear late in the spring and drop early in the autumn

wide. The leaves almost always have an odd number of leaflets. To find an ash leaf with an even number is considered to be a sign of good luck.

The twigs are stout and densely tomentose, with conical terminal buds and small, ovoid lateral buds.

In April or May, when the leaves begin to unfold, the flowers appear in dense clusters. The male and female flowers are always found on separate trees.

The fruit is an oblong to elliptical samara one to one-and-a-half inches long. It matures in early autumn. Seed is produced at about the thirtieth year; and heavy crops are released every three to five years thereafter. New trees are also produced by sprouts from the stump.

A moderately shallow but wide-spreading root system makes the tree unusually wind-firm.

The strong, hard and stiff wood of the Oregon ash resembles that of the other American ashes. The color is a dull yellowish-brown, with whitish sapwood. A cubic foot weighs about 38 pounds.

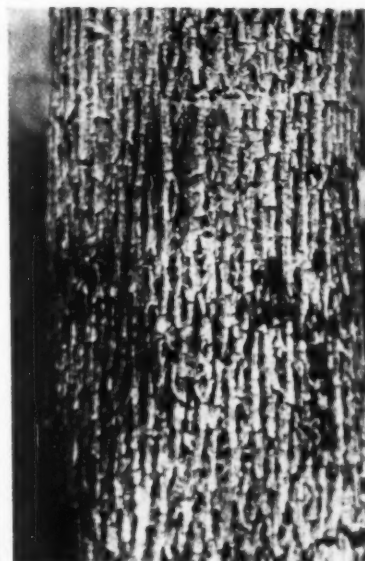
Although not abundant in commercial sizes, the Oregon ash is important by reason of the scarcity of hardwoods in the Pacific Northwest. The wood takes a polish and is used to a limited extent for furniture and interior trim. It is sometimes used for slack cooperage, tool handles, butter tubs, and wagon parts. However, the most notable use is for fuel, as the wood splits easily and has a heat value almost equal to that of oak and hickory.

The Oregon ash has been planted as an ornamental in the eastern United States and Europe. For this purpose it is suited by reason of its handsome shape, rapid growth, and hardiness.

The English botanist, Thomas Nuttall, who first described the species in 1849, records this curious legend: "An opinion prevails in Oregon among the hunters and Indians that poisonous serpents are unknown in the same tract of country where this ash grows, and stories are related of a stick of the black ash causing the rattlesnake to retire with every mark of trepidation and fear; and that it would sooner go into the fire than creep over it. It is singular to remark that a similar superstition concerning the ash prevailed even in the time of Pliny the natural historian."



Natural range of the Oregon Ash where it occurs from sea level to 3,000 feet



Flat ridges and diamond-shaped fissures give the dark gray-brown bark a woven appearance



The leaves are pinnately compound with five or seven leaflets, yellowish green above, paler and downy on the underside. The winged fruit is from one to one-and-a-half inches long

LUMBER OUTLOOK

Following is a summary of a statement prepared by the Division of Forest Economics, U. S. Forest Service, for the Senate subcommittee investigating the lumber situation.

UNITED STATES lumber production increased from a rate of about 26 billion board feet during 1935-1939 to a peak of 36.5 billion in 1941 and 1942. Since 1942 the trend has been steadily downward to a low of 27.4 billion feet in 1945. Moreover, the rate since V-J Day has been considerably below that of the 1945 total, and even below the 1935-1939 average. The downward trend has been attributed mainly to manpower problems, and to a lesser extent to lack and deterioration of equipment, unfavorable profit margins and shortages of timber. Depletion of forest growing stock has accentuated the manpower, equipment and cost-price relationships, to a greater degree than has been generally recognized.

It is estimated that production in 1946 will approximate 29 billion feet and will increase thereafter to a maximum level of about 33 billion annually. In subsequent years it is expected that sufficient manpower, mill capacity and equipment will be available for a marked expansion in output, but that limitations in availability and quality of mature timber and growing stock will control the level of production. This conclusion is based on the fact that timber reserves suitable for current lumbering operations are becoming increasingly limited in all regions.

In the Douglasfir region of Oregon and Washington, where about 25 percent of our lumber is produced, many mills are near the end of their operating life. About half the mills in Washington will be out of logs in five years and an additional quarter of the mills will run out in five to fifteen years. Development of operations in southwestern Oregon may offset partially the depletion elsewhere in the region. Although there is a considerable volume of small timber and old-growth in small tracts, large operators cannot use it economically, and the small-mill industry is not growing fast enough to offset the decreasing production. The blocking-up of timber in large holdings, adoption of sustained yield on private

lands, increased demands for veneer logs, and immaturity of younger timber stands lead to the conclusion that the Douglasfir region will cut less than during the war.

In the western pine areas, few undeveloped tracts of operable timber remain. Many mills have cut into their timber reserves during the war and will be forced to drop out of production in a few years. For example, 25 mills cutting 650 million feet a year have a life expectancy of seven years or less.

Lumber production in the South was greatly expanded during the war, but restoring output to wartime peaks of about 16 billion feet annually will be difficult because of local shortages of suitable sawtimber and competition with producers of pulp, poles, piling and other forest products.

Other eastern regions, producing about 10 percent of the total United States lumber cut, possess insufficient sawtimber of suitable size and quality to permit an early increase above recent levels.

Lumber inventories at mills and yards totalled about 17 billion feet in 1940-41, about 57 percent being at mills and concentration yards, the rest in the hands of distributors. By the end of 1945, only 4.6 billion feet remained in all lumber inventories, too little for efficient distribution and badly unbalanced as to lumber items, sizes and grades.

Prior to the war, imports of lumber were exceeded by exports, but beginning in 1941 the reverse has been true. The prospect of increasing the domestic lumber supply in the postwar decade by further increases in the excess of imports over exports is remote. Europe will probably require net imports of two and a half to three billion board feet during each of the next five years. Canada, our chief foreign supplier, probably will be able to send us about 800 million feet, a quantity larger than our prewar imports from Canada but less than wartime average.

Chief reliance for postwar lumber supplies must be placed upon domestic production.

Lumber requirements—the amount consumers would purchase if available at customary or reasonable prices—are estimated for 1946 at 29 billion feet, the same as production. This

is well below the wartime peak of 42 billion feet in 1942, and also below what subsequent requirements will be, because of expected difficulties and inevitable delays in converting to a peacetime economy. Following 1946, when a large expansion of construction activity is anticipated, lumber requirements are expected to rise rapidly to a maximum of about 40 billion feet annually, and to be maintained at or near that rate for several years. With a maximum production of 33 billion feet, this indicates a deficit of as much as seven billion feet annually during the peak years of the postwar building boom, and an average annual deficit for the postwar decade of two to three billion feet without allowing for the rebuilding of inventories.

A year ago, labor shortages were estimated to represent about half the total lumber production problem, but these are expected to be a decreasingly important factor during the remainder of 1946. Equipment and parts are not yet available in quantities needed by the industry. Continued delay in the production of equipment needed by the lumber industry will result in critical shortages during 1946.

Although shortages of standing timber were not generally emphasized as a production deterrent during the first years of the war, they did have direct and indirect effects in holding back production. These became increasingly noticeable in 1945. By February 1946, shortage of operable timber was recognized as a significant adverse factor in numerous areas. In subsequent years, stumpage is expected to be the principal deterrent to higher levels of output.

Until recently, production has not been affected adversely by ceiling prices, and compliance with price regulations has been generally satisfactory. Beginning in the fall of 1945, there were reports of increasing dissatisfaction with lumber price ceilings and increased violation of price regulations.

Most owners who practiced good management of their forest lands before the war continued desirable cutting practices during the war. Some increased the intensity of manage-

(Turn to page 240)



An International TD-18 Diesel TracTracTor yarding out a big one! The log scaled 10,000 feet! On this job near Loon Lake in coastal Oregon, logs were being moved 1800 yards to loading places from where they were trucked out to the Umpqua River and floated down to Reedsport. The TracTracTor cleared its own trails with the bulldozer blade. The yarder or logging arch shown permits hauling several times the tractor's own weight in logs.

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No other tractor of like size can outpull or outmaneuver the International Diesel TracTracTor. That's why you see Internationals logging the big ones, building trails and roads even where the route is rough, and handling heavy construction work.

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economical Diesel crawlers obtainable. They'll take on the tough jobs at new low cost because of their advanced-design features which assure superior performance, minimum maintenance and matchless operating economy.

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How Much Can Be Harvested?

(From page 214)

long as the forest lives, but it is more noticeable during the decades when stocking is comparatively heavy. While the earlier victims of such starvation are too small to have appreciable value, such material, from possibly age 30 on, should be saleable and thus eminently worth saving. Such salvage of material, periodically, before the trees die, together with removal of trees of poor form, is calculated to yield one cord or 500 board feet an acre a year from all well-stocked stands, besides leaving them in condition to produce better material. Thinning of dense young stands has long been practiced by foresters in Europe with twofold results of forestalling losses of usable material and increasing growth among the selected survivors.

Forest managers in the Douglasfir region, federal, state and private alike, are challenged by such an opportunity to add to forest productivity by salvaging material which otherwise would be lost. Forests rendered accessible for such management need no longer present high hazards of loss from insect or wind damage. The occasional beetle-killed or wind-thrown tree can be reached and salvaged promptly.

Obviously such a revolution in timber management will not take place over night, but there is no reason for delay in starting salvage operations in old, and thinnings in young, stands wherever road systems already exist, as is true of millions of acres.

Inaccessible stands must be opened up by permanent forest roads before these wood supplies, obtainable without decrease of future supplies, can be used. In railroad logging days three miles of railroad a square mile was commonly built and the rails pulled out after clear-cutting. For permanent management it is calculated that a minimum of a mile per 300 acres will be necessary, this to be supplemented at times by as much more temporary roads. Heavy-duty double-width road may cost \$12,000 to \$20,000, and single-width, \$6,000 to \$10,000, a mile.

Unlike the railroads which were used for crude utilization of one cut, these roads will eventually carry the tonnage from close utilization of all the timber now standing, plus that from further growth. Construction costs per thousand board feet will be low—\$1 to \$2. Maintenance will be low because, unlike railroads formerly used, materials used in construction are subject to neither rust nor decay. The road system, plus close utilization of timber formerly left to become forest fuels, will facilitate higher standards of fire protection heretofore unattainable.

How practical are these operations? The harvesting of whole stands in forests east of the Great Plains often yields no more than 1,000 to 3,000 board feet an acre. Partial cuttings are common, yielding even less. The partial cuttings contemplated in the Douglasfir region will commonly yield 5,000 board feet an acre and, in some cases, up to 10,000. Ever since about the year 1900, cedar shingle bolts have been harvested where the yield was five cords an acre and up. Cedar poles growing singly in young stands have been brought out from remote areas. Many other partial cuttings have been made. All developments needed are well within the capacities of loggers, foresters and workmen of the region.

Imagine a thinning operation in any age class from 30 to 100, designed to use up to 75 percent of five to ten years' growth (operation to be repeated at like periods). Modern equipment is used, adequate roads are provided, often using old railroad grades. Trees to be cut are marked by a competent technician. Limited areas of thin rough stands will be cut clean and these openings used to facilitate removal of selected trees from denser reserve stands.

Trees are felled by a power chain saw, insuring low stumps, and dragged full length by tractors to drag or swing saw site; limbs not knocked off are trimmed and thrown aside; the logs are cut to eight-foot lengths by power saw located on sloping site, saving all cuts six inches or more in diameter; the lengths are loaded cross-ways on trucks and hauled to concentration yard; the bark is removed by hydraulic barker; peeled logs 11 inches or more top diameter may be sawn into railroad ties.

All smaller logs and all slabs are ready to go to the pulp mill. A yield of at least one cord a thousand board feet of ties may be expected. On today's market, the 83.3 cubic feet of wood in the ties will bring about \$30, and the 90 cubic feet in the cord of pulpwood about \$10, f.o.b. cars. Wherever 100,000 board feet or more of logs can be concentrated daily, barking costs should not exceed \$1 a thousand board feet. Sawing will be cheapened considerably, and net returns increased.

Alternative to the above utilization procedure, there are other efficient techniques available for using thinnings. There is a large market for posts, poles and piling through the wood preserving industry. From stands 60 years or more of age lumber can be produced. Higher grades of lumber and plywood must be produced from selected trees, and stands carried into a second century of production; or from old growth stands brought under management. In both cases, yields and incomes will be obtained from each small forest division every five to ten years.

Of course, the negligent and short-sighted operator in these limited areas not in strong private hands or in public ownership, can use the same methods for premature destruction of young stands and thus cut off the higher returns from growing quality timber. Yet this is no excuse for the intelligent private forest owner or the public forest administrator to allow vast quantities of potential thinnings to augment mortality and provide fuels for forest fires.

The utilization of declining elements in old stands, of thinnings in young stands, and salvage of top logs and other small or partly defective logs from present logging operations, will throw on the market a great increase in short and small logs and cordwood material.

These materials are equal in size and quality to the general run of conifer logs and cordwood being cut currently east of the Great Plains. From them railroad ties, posts, poles and common lumber can be produced in great quantities. If the hydraulic barker is generally introduced to rid them of bark at the first concentration point, most slabs and log sizes below lumber size (four- to eight- or ten-inch tops) will constitute excellent raw material for the pulp and paper industry. Substitution of this low cost raw material for larger logs now often used in this industry would release the latter to lumber manufacture. General adoption of utilization along these lines would indeed provide a wide margin for expansion of pulp production. The writer refuses to believe that foresters, industrial managers and workmen of the Northwest are incapable of organizing this production from stump to finished products, or of protecting residual stands in the process.

How much annual production can be expected under this relatively intensive regional forest program? The federal government holds title to more than half the remaining standing timber of the region. Federal administrators calculate the sustained yield of these forests at about 2.2 billion board feet annually. Applying similar standards of management to state, local public and private lands would provide an annual cut of about 5 billion board feet—somewhat less

(Turn to page 246)

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- **Dipper Capacity**

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- **Operating Cost**



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BUILDERS OF ROAD MACHINERY

Austin Western

SINCE 1859

Ten Years in Georgia Pine

(From page 220)

is from 25 to 30 percent greater than in 1936.

Although management as a whole has made rapid strides in the coastal plains of Georgia, one of the essentials of good management, fire protection, is still in need of promotion. Wild fires continue to burn over large areas of forest land and an increased program of education and encouragement is necessary. In carrying out such a program, however, it should be kept well in mind that fire, without definition, is not always the evil it has been pictured. There are many types of fires which do no appreciable damage to coastal plains timber. Properly used, fire is now considered a silvicultural tool in the South; but wild fires, those that are started and allowed to run at will and at high intensity, have no place in forestry practice. Such fires do damage timber and a statewide fire prevention and educational organization is needed to prevent and control them—but the time has come to face the facts and give fire and fire prevention their proper places in the forestry program, rather than to use fire as a whipping-boy for propaganda.

Other interesting state-wide comparisons can be drawn between the results of the forest survey of 1936 and that of 1945-46. One of these is mortality from fire, insects, disease and weather. The 1936 survey showed an annual drain from all sources of 9,273,000 cords, of which 3,973,300, or 43 percent, was attributed to the mortality from the causes listed above. In comparison, the survey of 1945-46 shows an annual mortality drain from these same causes of less than 12 percent, or approximately a million cords. Much of this reduction can be attributed to the better market conditions existing during the war years when the survey was in progress, making possible the economical utilization of much dead and down timber previously left in the woods.

In addition to the reduction in loss from mortality, the better markets have led to other advantages. Thousands of acres have been improved by cutting trees of low quality and poor species. Under normal market conditions such trees would have little, if any, sale value and in most cases would be left to continue occupying space and lowering the quality of the stand as a whole.

On the other hand, as has been

previously noted, high prices and an increased demand have resulted in destructive cutting in many ownerships where no thought or care has been given to good forest management. The war years have presented the ideal time to "cash in" on timber that has been held, in some cases, for a lifetime, and which if properly handled would provide an excellent basis for continuous production. Considered as a whole, the war emergency has brought about improvement in slash and longleaf pine stands and



This twenty-year-old Georgia pine produces gum abundantly

deterioration of shortleaf and loblolly pine stands.

Complete and accurate data on all the elements of drain are difficult to obtain; however, what are believed to be fairly accurate figures for Georgia in 1945 can be presented here. It is believed that the utilization drain for 1945 amounted to eight million cords and the mortality drain to one million cords. This amounts to a state average of .35 cords for each acre of forest land.

Large or small, drain means little when considered alone. Growth must also be contemplated and growth data are difficult to obtain for an area of 25 million acres, encompassing hundreds of species, many soil types and several variations of stand density and other factors. No attempt was made by the 1945-46 survey to accomplish such a task in detail, but generalized figures were obtained,

which show an increment of 11 million cords for the year 1945. This is an average growth per forest land acre of .44 cords for all species and conditions, or an increase of growth over drain of .10 cords an acre for the entire year.

No record of Georgia's resources would be complete without mention of her thousands of acres of pine plantations. These plantations are the most striking of all examples of the landowners' interest in timber. Most of them are young, comparatively few being over 15 years old, yet many are already producing cordwood from thinnings, and some few in the naval stores belt have attained size which permits them to be chipped under the best naval stores practice. Growth in these plantations, especially in slash pine, is striking in comparison with other species in other sections of the United States. Plantations frequently attain an average height of 20 feet in from five to seven years, and it is reckoned that productions of 30 to 50 thousand board feet an acre at 50 years of age will not be uncommon. Small wonder that Georgia looks to her forests for a large portion of her future income.

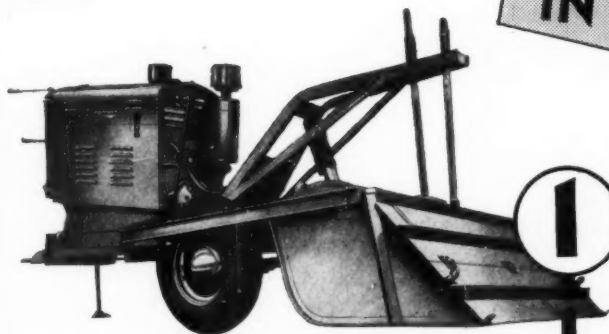
Georgia no longer stands at the crossroads of forestry. She has made the right turn and is now steadily progressing down the avenue of forest prosperity. Much, however, needs to be done. An increased forest nursery program, large enough to supply every landowner with as many seedlings as he desires at cost, or free of charge, is essential to get into production idle acres thrown out of crop cultivation or clear-cut without provision for natural reseeding.

Broad forest research covering every field of forestry should not be delayed. An exemplary start has recently been made by the establishment of the Piedmont branch of the Southern Forest Experiment Station. Similar stations should be established in the coastal plains and mountain areas. Further, funds should be provided for an active forest research program by the State Department of Forestry and the School of Forestry of the University of Georgia. The need is without question; trained personnel is available; only the funds are lacking.

Statewide fire protection is a must. Recent tests made by the State De-

(Turn to page 246)

ONE BASIC MACHINE DOING FOUR SEPARATE JOBS IN FORESTRY WORK



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LAND CLEARING



MAKING FIRE LINES



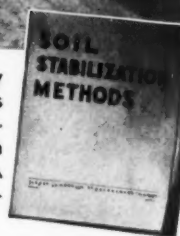
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AROUND THE WORLD

Missouri Valley Development on Way

The "go ahead" signal to begin construction under its program for the full development of land, water, mineral, and hydroelectric power resources of the 1300-mile long Missouri River Valley has been given to the U. S. Bureau of Reclamation.

The signal was the authorization of the award of a \$4,688,000 contract for building the Kortess Dam and power plant on the North Platte River, 60 miles southwest of Casper, Wyoming.

The Missouri Basin Plan calls for basin-wide development of natural resources, flood control, and improvement of navigation, and includes projects to be built in Montana, Wyoming, Colorado, North Dakota, South Dakota, Nebraska, Kansas, Iowa and Missouri. It envisages the construction of more than 100 new reservoirs that will hold more water than flows out of the mouth of the Missouri River in an entire year; 150 irrigation projects that will contain thousands of miles of canals and other facilities for creating 53,000 new farms from drouth-parched land; more than 20 power plants; safe water supplies for at least 19 communities; hundreds of miles of flood control dikes and levies, and 760 miles of uniform river channels for low-cost navigation.

"The start of construction is of sweeping significance," Secretary Krug said. "This will be one of the biggest engineering jobs of all time. It will take years to complete, and the cost will approach \$2,000,000,000. But the benefits that will accrue from this investment will repay it many times. Competent engineers have estimated that the benefits should average over \$175,000,000 per year."

To Reshape German Forests

Joseph C. Kircher, for the last 12 years regional forester in charge of U. S. Forest Service operations in the 11 southern states, has been named forest control officer and adviser to the military government in the American zone in Germany.

John Herbert Stone, former supervisor of the Nantahala and later the Pisgah National Forest in North Carolina, and previously assistant supervisor of the Cherokee National Forest in Tennessee, succeeds Mr. Kircher as

regional forester for the South.

The postwar forestry problem in Germany, to which Mr. Kircher will address himself under the military government, is two-fold:

First, to exploit the forests to the point where they can be made to provide reconstruction timber for Belgium, the Netherlands, and possibly France, without wrecking the forests for future generations.

Second, to permit the building up of German civilian wood production



Joseph C. Kircher

and industries without allowing the development of such production and industries as might create again an aid to war.

In other words, the war-making forests and forest industries of the former Reich must be exploited and modified to the point where they will contribute to reconstruction and reparations, where for many years they cannot constitute a potential weapon of aggression, but where at the same time they will contain enough young and growing trees to prevent erosion, maintain streamflow, and provide the basis for a requisite forest economy in a Germany finally peaceminded in the commonwealth of nations.

Wood Research Program Launched

Representatives of virtually every important wood-producing state and region in the United States met in Madison, Wisconsin, on March 18, to exchange information and ideas at a nationwide conference on state and federal forest products research programs. Host to the conference was the Forest Products Laboratory of the U. S. Forest Service.

Significance of the conference rested upon five major developments of fundamental importance to every wood-using industry of the nation:

1. It approved in principle a national forest products technical association that will open its membership to every state, federal, industrial, and private institution concerned with the conduct and application of research in forest products. The main objectives of the association are the free interchange of information among all members, the fostering of cooperative research among members in related fields, and the stimulation of a concerted attack upon forest products utilization problems of all kinds on as wide a front as possible without unnecessary duplication of effort. Forest products industries are invited to assist in the formation of the new organization in order that it may serve the needs of industrial men as well as research workers.

2. The conference made possible for the first time a clear picture of the problems being concentrated upon in forest products research, the varying objectives of the institutions represented at the meeting, the scope of existing research facilities and projects, and the research needs of the different states and regions.

3. Delegates to the conference took back to their own institutions a fresh conception of the value and purposes of their individual research problems and programs.

4. The scope of research under way and projected brought to new prominence the importance of forest products research to all users and consumers of wood.

5. The conference, by bringing together the leaders in state and federal forest products research, marked an epochal forward step in the progress of research in this field.

Conservation Instruction at Rutgers

A faculty committee at Rutgers University is developing plans for conservation instruction designed to make conservation an integral part of general as well as professional education in the university. Plans also are being laid for the formation of a Raritan Valley Conservation Council in an effort to enlist the aid of industrialists and civic leaders in meeting local conservation problems. The committee states, "No student should graduate from Rutgers without coming in contact with the basic facts and principles of conservation and the effects of the lack of conservation upon human history."

British Columbia Sustained Yield

In a report with which the British Columbia Loggers Association, the Truck Loggers Association of British Columbia, and the pulp and paper industry have recorded general agreement, Chief Justice Gordon Sloan recently recommended the formulation of a system of planned forest manage-

ment and forest industry regulation.

Long-range financing of the program would be derived from direct forest revenue instead of annual appropriations. A three or five man commission, independent of government and industry, would be established to manage British Columbia's forest resources. The proposed program includes: accelerated reforestation; regulation of logging methods to prevent destruction and to insure regeneration; new systems of taxation and tenure to encourage private forestry; grading of hemlock logs, cessation of export of Douglasfir and hemlock logs; formulation of regional working circles; a long-term program of education; and more forest research.

Forestry Library Aid Developed

A system of classification of forestry information for filing and library use has been developed by the Timber Development Association, Ltd., London. A thoroughly comprehensive classification with index numbers under a decimal system, it covers all subjects connected with forestry, lum-

ber and lumber utilization. It is adaptable to use by students, colleges and industrial organizations faced with the problem of filing or recording correspondence or data on forestry subjects.

Paper Company Grants Scholarships

The Union Bag & Paper Corporation has established two forestry scholarships at the George Foster Peabody School of Forestry of the University of Georgia, and two forestry fellowships at the School of Forestry, Duke University.

The purpose of the awards is to stimulate the interest of young men in forestry problems of private owners, and to assist in the education of qualified forestry students.

The two four-year scholarships will be awarded each year to high school graduates of Georgia for study leading to a degree of bachelor of science in forestry. Scholarship winners will receive \$400 during each school year of the four-year course.

Fellowships carry awards of \$800 each and a joint fund of \$900 for travel and incidental expenses.

HUNT HEADS U. S. FOREST PRODUCTS LABORATORY, WINSLOW GOES TO WASHINGTON



George M. Hunt



Carlile P. Winslow

Carlile P. Winslow, internationally known leader in forest products research and director of the U. S. Forest Products Laboratory at Madison, Wisconsin, since 1917, left the laboratory on February 28 to become consultant in forest products to the U. S. Forest Service in Washington, D. C. He has been associated with the laboratory since its founding in 1910. The new director of the laboratory is George M. Hunt, formerly assistant director, a native of Oregon, and a graduate of the University of California. Mr. Hunt has been a member of the Forest Service since 1911, serving at San Francisco and Seattle before going to Madison.

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FOREST SCHOOL NEWS

Georgia Starts New Research

In cooperation with the Southern Forest Experiment Station, the George Foster Peabody School of Forestry at the University of Georgia will inaugurate a forestry research program combining the work on the Hitchiti Experimental Forest at Round Oak with that on forested lands near Athens. The work will be headed by George K. Stevenson of the U. S. Forest Service, assisted by professor A. E. Patterson of the School of Forestry.

Yale Establishes New Camp

Through arrangements with the Crossett Lumber Company, a new Yale Forest School field camp is being constructed a mile east of Crossett, Arkansas, where Yale students will be instructed in forest management, surveying, mapping, estimating and wood utilization. Facilities of the Crossett company will be available to the students during their residence from March through May of this year.

Penn State Enters Pulpwood Research

The Armstrong Forest Company, supplier of pulpwood to the mills of the New York and Pennsylvania Company, Inc., and the Castania Paper Company, has entered into a cooperative agreement with Pennsylvania State College for research on mechanized pulpwood operations. Research will be conducted by Penn State's forest school on the company's 9,000 acres of forest land in Clinton County, within 40 miles of State College. The objective is to correlate the production of peeled pulpwood by mechanical methods with the practice of sound forestry principles.

Sawmill Research at Michigan

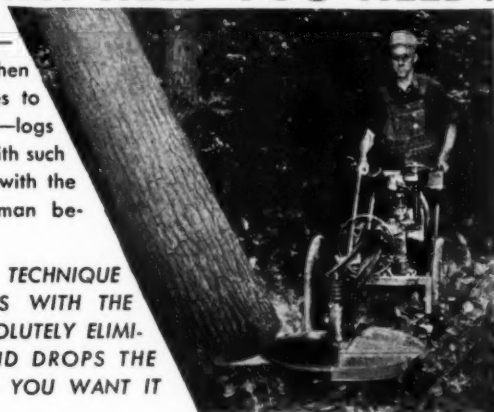
A research project for the improvement of small sawmills has been inaugurated at Michigan State College. The project is jointly sponsored by the Michigan State Planning Commission, the Lake States Forest Experiment Station and the Agricultural Experiment Station of the Michigan State College.

In a progress report on the project, Michigan announces a new type scale board which indicates the cant width for subdividing logs without waste.

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MAN'S POOR RELATIONS, by Earnest Hooten. Published by Doubleday, Doran and Company, Garden City, New York. 412 pages, illustrated. Price \$5.00.

This volume is a delightfully entertaining scientific work rich with wisdom, humor and irony. Written on the subject of primates—lemurs, tarsiers, monkeys and apes—it covers their whole natural history and evolution in style which popularizes the subject without sacrificing scientific integrity. It is not unlikely that this book will be disconcerting to those arrogantly proud of human development, for it reveals many startling facts about characteristics—and not all anatomical—that we have in common with our “poor relations.” The author divides his book into three sections: Ape Aristocrats, Totalitarian Monkeys and Backward Primates, which suggests the whimsical approach he has used in presenting his material.

WILDWOOD WISDOM, by Ellsworth Jaeger. Published by The Macmillan Company, New York, N. Y. 491 pages, illustrated. Price \$2.95.

The reader of this volume will find it a fascinating display of Mr. Jaeger's talents as an author, artist and naturalist. The gift of making even the most commonplace details of camp life exciting to read about is indeed a rare one.

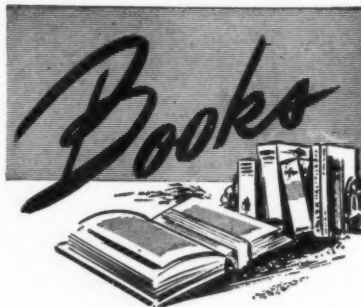
The book consists of a complete coverage of the real woodsman—what he wears, how he travels, what he eats and how he sleeps. Moreover, we are told how each item is made and cared for. Added interest is given by the detailed line drawings. The whole makes a compendium of that great art of woodcraft which every outdoorsman studies unceasingly.

HUNTING, FISHING, AND CAMPING, by L. A. Anderson. Published by the Macmillan Company, New York, N. Y. 212 pages, illustrated. Price, \$1.95.

An investment in this practical and readable handbook will help to make a success of your next trip to the woods. It is well illustrated, with action photographs.

THE CHEMICAL FORMULARY—Volume VII. Edited by H. Bennett. The Chemical Publishing Company, Inc., Brooklyn, New York. 474 pages. Price, \$6.00.

A collection of valuable, timely, practical commercial formulae and recipes for making thousands of products in many fields of industry.



THE FLORA OF OAKLAND COUNTY, MICHIGAN, A Study in Physiographic Plant Ecology, by Marjorie T. Bingham. Published by Cranbrook Institute of Science, Bloomfield Hills, Michigan. 155 pages, illustrated. Price, \$1.00.

Besides the local interest attached to such a work, this booklet serves as a model of an exhaustive treatise on a local flora. A complete picture of the area is built up by an analysis of each plant community type, preceded by a geological history and followed by an annotated list of plants.

PLANT GROWTH, by L. Edwin Yocum. The Jaques Cattell Press, Lancaster, Pennsylvania, 203 pages, illustrated. Price, \$3.00.

For the layman with a garden, this book is ideal, for it carries him beyond the seed catalogue to a point where he understands something of the intricate processes that make his garden grow. A careful reading of this book will provide interest and knowledge to anyone who has the instinct to plant and harvest.

ADVENTURES IN SCENERY, by Daniel E. Willard. Published by Jaques Cattell Press, Lancaster, Pennsylvania. 437 pages, illustrated. Price \$3.00.

Intended as an interpretation rather than a presentation of results of scientific investigations, this volume on the geology of California does much toward removing that science from the classroom and presenting it as an earth science related to everyday life.

For a work of this kind no better state could have been chosen than California—land of contrasts, where in can be found the hottest place known to mankind; regions of perpetual snow; mountains and plains; highest and lowest points in the States; unsurpassed variety of plant and fascinating range of animal life. Written in simple language, it is an instructive and stimulating volume.

The publications listed below must be ordered direct from the addresses as given and not through the Association.

Forest Fire Outlawed as a Timber Thief, Circ. No. 1; *The Arkansas State Forestry Commission*, Circ. No. 2; *The Unburned Woods*, Bull. No. 5; *Forest Planting In Arkansas*, Bull. No. 6 and *Wooden Riches*, Bull. No. 10. Published by Arkansas Forestry Commission, Little Rock, Arkansas.

Texas Forestry Progress, 1943-1944, Bull. 32, Texas Forest Service. W. E. White, Dir., College Station, Tex.

The Mourning Dove As A Game Bird, by Frederick C. Lincoln. Circ. 10, Fish and Wildlife Serv., U. S. Dept. Int. Supt. of Docs., Wash., D. C., Price 5 cents.

Improving the Distribution of Water to Farmers by Use of the Parshall Measuring Flume, by Ralph L. Parshall. Bull. 488 Soil Cons. Serv., cooperating with Colo. Agr. Expt. Sta., Colo. A. & M. College, Fort Collins, Colo.

Biennial Report of the Vermont Department of Natural Resources, 1943-44. Free Press Printing Co., Burlington, Vt.

California Second-Growth Pine—a perpetual crop, by C. R. Clar. The State Board of Forestry, Sacramento, California.

Timbers of the New Guinea Region, (from “Tropical Woods”), by H. E. Dadswell. Yale University School of Forestry, New Haven, Conn. Price 30 cents.

Parks—Published by The National Park Service, The Merchandise Mart, Chicago, Ill.

Improving California Ranges, by Burle J. Jones and R. M. Love. Circ. 129 of the California Extension Serv., Berkeley, Calif.

Wood Yeast Protein As A Feed for Livestock, by E. G. Ritzman. Tech. Bull. 88 of the Agric. Expt. Sta., Univ. of New Hampshire, Durham, N. H.

The Potomac River Basin—An Introductory Report. Published by the Interstate Commission on the Potomac River Basin, Washington, D. C.

First - Season Records of Cattle Weights from a Pine-Timber Range and a Mountain Meadow Range, by N. W. Talbot and A. L. Hormay. Note No. 44, Forest Service. Calif. Forest and Range Expt. Sta., Berkeley, Calif.

THE ROCKY MOUNTAINS, by Wallace W. Atwood. Published by Vanguard Press, New York. 324 pages, illustrated. Price, \$3.75.

For the armchair naturalist or traveler who may never experience the Rockies, this book is the next best thing. For the person who has been there, Dr. Atwood's story of our most magnificent mountain area will help relive the thrills and the grandeur of the area. For one planning to visit the Rockies, the book is must reading—a guide to how to enjoy to the fullest all that the area has to offer.

Outdoorsman, geographer, geologist and educator, Dr. Atwood has been president of Clark University since 1920 and is the foremost authority on the Rockies, where he has spent more than 20 summers. Published as part of the *American Mountain Series*, edited by Roderick Peattie, this book combines a fascinating personal story with a popular history of the building of a mountain range.

SON OF THE WILDERNESS—The Life of John Muir, by Linnie Marsh Wolfe. Published by Alfred A. Knopf, Inc., New York. 348 pages, illustrated. Price \$3.50.

An absorbingly interesting biography of the famous conservationist, author and self-styled "tramp," who spent his life glorifying and loving the wonders of nature. This book is rich with personal anecdotes and references, and contains complete and extensive notes, as well as many illustrations.

BRAZIL—ORCHID OF THE TROPICS, by Mulford B. Foster and Racine Sarasy Foster. Published by The Jaques Cattell Press, Lancaster, Pennsylvania. 306 pages, illustrated. Price \$3.50.

The Fosters take their readers with them to South America, where they discovered over 40 heretofore unknown botanical specimens—rare examples of bromeliads, orchids and cacti.

The book is profusely illustrated, with photographs, sketches and kodachromes.

THE LOST WOODS, by Edwin Way Teale. Published by Dodd, Mead & Company, New York. 317 pages, illustrated. Price \$4.00.

This book of warm, glowing narrative, is written by a naturalist who knows how to capture moments of beauty with words which do the incidents justice. With few exceptions, each chapter could be a stirring nature study in itself, amply illustrated with excellent photographs by the author.

Wildlife Merger

The American Wildlife Institute, which succeeded the American Game Association in 1936, has merged its public activities with those of the Wildlife Restoration Institute, recently organized. The new organization will maintain its headquarters in Washington.

Announcement of the merger and the establishment of a wildlife foundation with a substantial financial backlog was made by President Frederic C. Walcott, of the Wildlife Institute.

Dr. Ira N. Gabrielson, retiring director of the U. S. Fish and Wildlife Service, will become president of the Wildlife Restoration Institute. This new institute will absorb all present activities of the American Wildlife Institute, and in addition will set up a complete service and research organization better to correlate and advance the activities of cooperating agencies in the field of wildlife restoration and conservation. The new institute will sponsor the annual North American Wildlife Conference.

A foundation has been formed to be headed by Mr. Walcott. The purpose of this foundation is to render moral support and financial assistance to wildlife restoration and conservation in much the same manner as existing foundations are advancing the cause of public health and education.

This evolutionary step will assure to the conservation movement the continued service and leadership of both Doctor Gabrielson and Senator Walcott, it was stated.

As soon as Dr. Gabrielson is released from his government responsibilities he will begin active work on a program and organization for the new Institute.

Soil Conservation Society

Formation of the Soil Conservation Society of America, a professional organization, is announced by J. H. Christ of Portland, Oregon, national secretary-treasurer.

Ralph H. Musser of Milwaukee, Wisconsin, is president, and A. E. McClymonds of Lincoln, Nebraska, is vice-president. Dr. Hugh H. Bennett, chief of the Soil Conservation Service, is founder of the society, which will "promote and advance all phases of the science of conservation of soil and water resources; to provide a medium for exchange of facts, experience and thought; and to present, advance and protect the standards of the science of soil and water conservation."

Charters have been granted to 10 chapters throughout the United States.



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Lumber Outlook

(From page 228)

ment. However, the acreage handled under good management was mainly in large ownerships and formed only about 14 percent of the 202 million acres of privately owned non-farm forest land. As a result of increased prices for forest products, specifications as to the minimum diameter of the tree or log, and the minimum stand per acre considered merchantable were decreased. This had some beneficial effects in permitting for the first time the utilization of some species, sizes and qualities which were in need of harvesting.

It also had detrimental effects: it permitted cutting, often clear or destructive cutting, of stands of small immature timber which covered large portions of the East—stands needed for supplying local industries during the next decade; it caused, especially in the East, removal of scattered stands and even individual trees of special value, not only decreasing the value and desirable composition of the remaining stand, but also affecting the composition, quality and value of later stands for decades to come.

The impact of the war has emphasized the importance of forest resources and the urgent need of formulating and applying promptly an adequate program for rebuilding these resources. The program can and should be initiated even while, and in conjunction with, obtaining the urgently needed material for housing and similar programs.

Steps to reduce lumber demand may include: (a) limitation of exports; although it is doubtless true that a complete embargo on lumber exports might slightly increase the domestic supply, it is felt that continuing the flexible wartime system of licensing exports would be preferable to a rigid statutory prohibition; (b) distribution controls; during the war, demand was controlled by regulations affecting distribution of lumber; these were dropped in the fall of 1945, but were restored, in part, in January 1946 when priorities assistance was granted veteran housing.

Measures to increase supply must be aimed at increased production. Acceleration of the rate of cut on the national forests, particularly in the West, is largely dependent on additional road facilities. Although new road construction undertaken in 1946 would not directly increase production to a marked degree until 1947, it would have an indirect effect by

assuring operators that timber areas thus opened up would be available when their own are exhausted.

In order to maintain the present level of cut on the national forests, approximately three percent of the total national cut, would require \$7,000,000 of construction funds for new timber access roads. Under present authorizations it would be possible to appropriate \$23,000,000 for forest development roads for the fiscal year 1947. Approximately \$5,500,000 would have to be used for essential maintenance of the present forest development road system. This would leave \$10,500,000 for construction of access roads into other new timber areas and result in increasing the cut from national forests about 90 million feet this year, 550 million in 1947, and 700 million annually for the remainder of the postwar decade.

The Forest Service considers that access road construction to the full extent authorized is the most significant step which can be taken now to increase the contribution of the national forests to the lumber supply.

During the war, at the request of the War Production Board, the Forest Service administered a field program to stimulate increased production in the small mills of the East. Many of the problems on which this field force lent assistance still exist. The Service believes that a program which will aid local operators to solve their production problems and bottlenecks will be able to increase the production from the many small operators by as much as one billion feet annually at a cost of about one dollar a thousand feet.

Other steps to increase production include the establishment of lumber prices at a level which will return a fair profit to operators, wages sufficiently high to place the lumber industry in equal competitive basis with other industries; prompt settlement or avoidance of labor-management disputes, determination of essentiality and granting priorities assistance accordingly among the various types of forest products industries.

Long term measures advocated by the Service include (1) public aids and services to private owners; (2) public control of cutting and other forest practices on private lands; (3) expansion and development of national forests; (4) a forest works program of capital improvements.

Wood and the Atom Bomb

By ROBERT TURNER

THE man who wondered during the war why he couldn't find a couple of boards to patch his porch can blame at least part of his troubles on the atom bomb and be glad. Construction of the two great production centers in Tennessee and Washington drained 360 million board feet of lumber from the market, and only the elect few who bore the awful secret knew where it went.

According to Major General Leslie R. Groves, commander of the Manhattan Engineer District, the code name for the atom bomb project, 120 thousand were employed in the undertaking at the peak. Besides workshops and offices, it was necessary to create from scratch model industrial cities at Oak Ridge, Tennessee, and Richland, Washington—complete from drug stores to churches. There were also extensive installations at the Pacific-island base which was the jumping-off point for atomizing Japan.

Virtually all types of construction lumber and some hardwoods were represented in the total but, naturally, the bulk of that used in Oak Ridge was southern pine produced by a number of southern mills. Lumber used at Richland came from hundreds of western mills. Also, some 35 million square feet of plywood were used for housing alone. Used lumber was salvaged for shipping surplus material and equipment from the jobs.

About 20 percent of the lumber was procured on the open market and 80 percent through the auction system conducted by the Central Procuring Agency which purchased lumber for all the war services and agencies.

The town of Oak Ridge, erected on a 59,000-acre reservation in a sparsely populated area 18 miles west of Knoxville, had a population of 75,000, the fifth largest city in Tennessee. At the peak 47,000 construction workers were engaged in building it, reaching a rate of 1,000 buildings a month. The plant comprises 425 buildings.

Richland Village, Washington, is located on a 631-square-mile reservation near Pasco. Living quarters built there include 928 duplex housing units and 644 single-family dwellings, 25 dormitories in one and two-room units totaling 986 beds, and 1,803 prefabricated houses of plywood. Constructed new or remodeled from existing structures are 57 larger buildings which include churches, schools, public service establishments and shops.

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CONSERVATION IN

Congress



By A. G. Hall

BUDGET estimates of the Tennessee Valley Authority have not yet been submitted to the Congress, but it is understood that for forestry and related conservation items they will be essentially the same as those approved last year. The TVA program is financed from Congressional appropriations and from proceeds from the sale of power and other products. For the fiscal year 1946 the appropriated funds amounted to \$22,067,975 while the 1947 estimate is \$36,572,000. The forestry and related conservation items in 1946 were: developmental activities, \$6,149,000, of which \$525,000 was for forest development and utilization, \$67,000 for fish and game resource development, \$202,000 for recreational resource development, and a total of \$5,355,000 for other developmental activities, chiefly in agriculture and fields related to forestry, such as soils and minerals. While the forestry items for 1947 are placed at the same figures as for 1946, the other developmental activities will be increased in the budget estimate. A slight increase will be requested in the appropriation for administration expenses which was \$61,000 in 1946. The estimate for forest protection of reservoir properties, \$30,000 in 1946, is expected to be unchanged.

The bill introduced by Congressman Thom of Ohio, on April 2 to authorize the Secretary of Agriculture to assist in increasing lumber production provides for a service similar to that rendered to the small and medium-size sawmills during the war. Approximately one-half of all domestic lumber production comes from such mills. The wartime program was financed and directed by the War Production Board with the U. S. Forest Service serving as the operating force. Initially the program was one that had to be "sold" to the lumber industry. It is a fair appraisal of the situation to state, however, that the Timber Production War Project did not prove to be the "government-control, government-interference" program that its early critics supposed it would be. The need for lumber is

still acute, even though the shooting has stopped. The question now is whether or not the industry will support a similar program in peacetime, especially when the control of the program is vested in an old-line government agency rather than in a wartime agency largely of men from industry.

Four new bills introduced in the House are each designed to protect wildlife resources on navigable waters administered by the War Department. They direct the War Department to give full consideration and recognition to the needs of wildlife and wildlife habitat, and to consult with the state agency administering wildlife resources and with the Fish and Wildlife Service for the purpose of determining the required water needs of the fish and other wildlife resources. In the case of the Mississippi River, the bill specifically would prohibit the draining of any pools between Minneapolis and St. Louis during the period November 15 to April 1, except during flood periods, run-offs or when necessary for essential repairs; in other seasons the maximum permitted lowering of the level is stipulated at one foot.

Of interest to foresters, nurserymen, pathologists and entomologists, is the bill introduced by Senator Thomas of Oklahoma, which would amend the Plant Quarantine Act by authorizing the limitation of entry of nursery stock from foreign sources to that needed for propagation purposes, including the requirement, if necessary, that imported nursery stock be grown under pest-entry quarantine or under the supervision of the Department of Agriculture. This bill will permit the Secretary of Agriculture to control imports of nursery stock in a manner similar to that employed by him prior to 1943 and will provide the means for exclusion of foreign insect pests and diseases. It is understood that the bill has the support of the National Plant Board and the Association of Secretaries, Commissioners and Directors of Agriculture. Early hearings are expected.

The second deficiency appropriation bill for 1946 includes \$32,000 for insect investigations, and \$20,000 for insect and plant disease control in the appropriation for the Bureau of Entomology and Plant Quarantine; and an additional \$168,000 for national forest protection and management. In the Interior Department's appropriation, an additional \$20,000 is earmarked for fire fighting on

Grazing Service lands, and \$50,000 for suppression or prevention of forest and range fires on Indian lands. For the Fish and Wildlife Service the appropriation for personal services is raised from \$704,828 to \$729,000. All these increases are in addition to overall amounts to be appropriated for meeting increased pay costs as authorized by legislation enacted during 1945.

CONSERVATION CALENDAR

Important Bills in Congress With Action to April 10, 1946

Fish and Wildlife

H. R. 4362—BATES—(S. 1496—SALTONSTALL and WALSH) (S. 4364—LANE)—To abolish the Parker River National Wildlife Refuge in Essex County, Massachusetts, to authorize the restoration to the former owners of the land comprising such refuge. Reported from the Committee on Agriculture, February 12 (Report 1555). Passed House April 1. Referred to Senate Committee on Agriculture and Forestry, April 2.

H. R. 5855—ANDRESEN (H. R. 5865—HULL, H. R. 5885—STEVENSON) To promote the conservation of wildlife, fish and game. Referred to the Committee on Rivers and Harbors, March 25.

National Monuments

H. R. 5859 — FERNANDEZ — To amend section 2 of the Act entitled, "An Act for the Preservation of American Antiquities," approved June 8, 1906. Referred to the Committee on Public Lands, March 25.

Appropriations

H. R. 5890—CANNON—Making appropriations to supply deficiencies in certain appropriations for the year ending June 30, 1946 (Second Deficiency Bill). Passed House March 27. Referred to Senate Committee on Appropriations, March 28.

Payments to States

H. R. 5941—WINSTEAD—To provide for payments to the states with respect to certain lands of the United States. Referred to the Committee on the Public Lands, March 28.

Parks

S. J. Res. 152—BYRD—To provide for the maintenance for public use of

certain highways in the Shenandoah National Park. Referred to the Committee on Public Lands, April 4.

S. 2043—PEPPER—To provide that the United States shall aid the states in the acquisition and development of systems of state parks. Referred to the Committee on Public Lands and Surveys, April 8.

H. R. 4435—LEMKE—To establish the Theodore Roosevelt National Park; to erect a monument in the memory of Theodore Roosevelt in the Village of Medora, North Dakota. Reported by Committee on Public Lands (Report 1787), March 19. Passed over in House, without prejudice, April 1.

National Forests

H. R. 6068—ENGLE—To authorize the Secretary of Agriculture to permit the prospecting, development, and utilization of the mineral resources of national forest lands not subject to the operation of the general mining laws or the Mineral Leasing Act. Referred to the Committee on Agriculture, April 10.

H. R. 2854—ENGLE—To add certain public and other lands to the Shasta National Forest, California. Reported from the Committee on Public Lands, April 5. Report No. 1876.

Miscellaneous

S. 1990—THOMAS—To amend the Plant Quarantine Act approved August 20, 1912, as amended, by adding thereto a new section. Referred to the Committee on Agriculture and Forestry, March 27.

H. R. 5973—THOM—To authorize the Secretary of Agriculture to assist in increasing lumber production. Referred to the Committee on Agriculture, April 2.

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Lumberjack Tune Detective

(From page 217)

I love a girl in Manistee;
 She lives with her mother.
 I defy all Michigan
 To find such another.
 She's tall and slim, her hair is red,
 Her face is plump and pretty.
 She's my daisy Sunday best-day girl
 And her front name stands for Kit-ty.

Chorus—

Bung yer eye! Bung yer eye!
 I took her to a dance one night;
 A sailor did the bidding.
 Long Tom he bossed the whole she-bang,
 And Big Dan played the fiddle.
 We danced and sang the livelong night,
 With fights between the dancing,
 Till Long Tom cleaned out the whole damned place
 And sent the sailors prancing.

Lumberjacks, disappointed in love,
 at times chanted songs that made them appear to be women haters. One of the best known of the shanty-boy ballads is "The Flat River Girl", the story of Jack Haggerty and his girl. It had its origin in the Flat River country and spread to all sections of Michigan. One version follows:

I'm a brokenhearted raftsmen, from Greenville I came,
 I courted a lassie, a lass of great fame.
 But cruel-hearted Cupid has caused me much grief;
 My heart it's asunder, I can ne'er find relief.

My troubles I'll tell you without more delay,
 A comely young lassie my heart stole away;
 She was a blacksmith's only daughter from Flat River side,
 And I always intended for to make her my bride.

I brought her rich jewels and the finest of lace;
 With the costliest of muslins it was her I'd embrace.
 I gave her my wages for her to keep safe;
 I begrudged her nothing that I had myself.

My name is Jack Haggerty where the white waters flow;
 My name it's engraved on the rocks of the shore.
 I'm a boy that stands happy on a log in the streams.
 My heart was with Hannah, for she haunted my dreams.

I went up the river some money to make;
 I was steadfast and steady, I ne'er played the rake.
 Through Hart and through Shelby I am very well known;
 They call me Jack Haggerty, the pride of the town.

One day on the river a letter I received
 That it was from her promises herself she'd relieved;
 She'd be wed to a young man, who a long time delayed,
 And the next time I'd see her she would not be a maid.

Then adieu to Flat River. For me there's no rest;
 I'll shoulder my peavy, and I'll go out West;
 I'll go to Muskegon some pleasures to find,
 And I'll leave my own Flat River darling behind.

So come all you jolly raftsmen with hearts stout and true,
 Don't depend on a woman; you're sunk if you do.
 And if you chance to see one with dark chestnut curls
 Just think of Jack Haggerty and his Flat River girl.

Japan

(From page 207)

minimum amount of firewood absolutely necessary for 1945 was about 8.5 million cords. Five million cords of this were to be used as wood and 3.5 million for the manufacture of charcoal.

Charcoal is manufactured in small kilns or pits located on the forested areas. About half of the production is manufactured the year round—the other half from November to March. This provides extra employment for many people of the rural areas during the time that there is little for them to do on the farms.

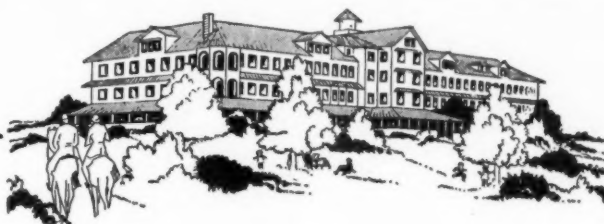
While much of the wood itself is used near the point of cutting, charcoal is shipped to all parts of the nation. Japanese homes are not fitted for burning firewood for heat, although it can be used for cooking. Heat is furnished mainly by open charcoal burners or braziers. A Japanese family may have only one of these braziers, in which case the entire family huddles around it on cold nights.

Due to the gasoline shortage, charcoal burning units are affixed to most all Japanese automobiles and trucks. About 320 thousand metric tons of charcoal will be required annually for this purpose until these cars are reconverted to gasoline consumption—if this takes place. Although cars run on charcoal do not have the power of a gasoline-driven vehicle, it does furnish economical transportation. In Japan it is common to see cars stop at the bottom of a hill to generate enough gas power to take them over the top. Also, it is a common sight even in the metropolitan areas to see an individual stop his car, go around to the back with a metal rod and pull out the ashes or "clinkers", leaving them in the middle of the street, red hot and smoking.

Clothing is being furnished by the forests in the form of rayon. War-time production of rayon pulp amounted to 198 thousand short tons annually, requiring about 384 thousand cords of wood.

Japan has long been an importer of cotton and wool. Any clothing product that can be manufactured at home is vital to the present reconstruction period. Although silk is widely used, there is a need for a cheaper material. Rayon is helping to fill this need.

Direct from the forest come wooden clogs or *getas*, the traditional and universal footwear of the Japa-



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See Page 236

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CINCINNATI 2



OHIO

nese people—men, women and children. These are held on the foot by cloth straps passing between the big and second toes. Japanese foresters estimate that about 20 million cubic feet of wood will be required for this purpose during 1946.

Japan's forests are helping furnish the four basic essentials of her post-war economy—food, shelter, fuel, and clothing. But at present the drain of wood volume from her forests is between two and three times the growth. To continue such drain and not bring about severe erosion damage will require even more intensive forestry practice than exists at present. Although a large part of Japan's forests are under management, there are vast areas in the mountains of the interior that have never been exploited or placed under scientific forestry. The total annual growth of wood for the nation could be materially increased by placing these areas

under intensive forest management.

The yield can be further increased by more intensive practice on the more accessible forest lands, particularly those in private ownership. Artificial planting of clear-cut areas, delayed during the war, and planting of the seven million acres of non-productive forest land will materially increase the yield.

Losses from insects, fungi and fire are very slight in Japan. The climate and soil are conducive to rapid tree growth, and the indigenous tree species have rapid growth rates.

Thus, with more intensive forestry the present annual growth figure of 685 million cubic feet as given by the Japanese Bureau of Forestry could be increased. Demand for wood will decrease following the reconstruction era. The increasing growth rate over a period of time should closely approach normal drain of wood volume from the forests.

Ten Years in Georgia Pine

(From page 232)

partment of Forestry indicate the feasibility and low cost of detection by cruising airplane. Delay in establishment of protection facilities in areas now neglected means further loss, which Georgians can ill afford.

Intensified educational forestry programs are needed at all levels. Forestry education must be brought into all the public school systems as a full-fledged subject, not as an extra-curricular activity or pastime. Textbooks and teaching methods should be revised to include forestry principles in school curricula from kindergarten through high school. Adult

education must not be slighted, and extension services should be increased manifold. The University of Georgia School of Forestry should be encouraged to continue producing the South's leaders in the forestry profession.

By these methods, and only by these methods, can Georgia maintain and increase the rate of progress thus far exemplified. The way is clear; the survey of 1945-46 has appraised the resource; the program has its foundations; the people are desirous—they need only make themselves heard.

How Much Can Be Harvested?

(From page 230)

than half the present industrial requirements of the region. Evaluation of sources of production overlooked in such calculations but available through normally intensive forest practices described above, support the conclusion that existing forest stands are capable of supporting sustained yield beyond any annual cut ever realized in the region; certainly not less than 13 billion board feet each year, possibly more than 15 billion!

Two important considerations must, however, be held in mind. First, the log sizes realized by these methods cannot readily be utilized with-

out an expansion in industries using small logs. Second, all these additional sources of yield must be utilized currently. Otherwise, the trees that should have been cut will be added by windfall and other destructive agencies to the great forest fire fuel supply already on the forest floor.

The forest industries are therefore counseled to proceed conservatively by trial and error, controlled by good accounting practices, toward these changes which in themselves constitute conservatism on the highest level directed to the welfare of industry and the dependent communities.



COULD THIS BE YOUR HOUSE?

Now that the war's over and a lot more civilian goods are on the market, it's a big temptation to spend just about all you make, and not put anything aside.

But to fall for that temptation is plenty dangerous. It's like trying to live in the house above—a house that might come tumbling down about your ears at the first little blow of hard luck.

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Public-spirited citizens, industrialists and organizations alert to the need of forest conservation and development in postwar economy are making this survey possible by underwriting its estimated cost of \$250,000.

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5-46

Suburban Wilderness

(From page 225)

percent fall within this category. The 188 thousand acres of farm woodlots are not so well protected, and only about 20 percent of the state marking is done on farmers' holdings. About half of the farms are mortgaged and are constantly under pressure to take the whole profit at once.

In marking timber, both the silviculture of the forest type concerned and the character of the available markets must be considered. Oak should be grown in even-aged stands in at least partial sunlight. What is technically known as a three-cut shelterwood, whereby the stand is removed in three operations, 15 to 20 years apart, is well suited both to the species and to the wood-using economy of the region.

This is definitely geared to specialty products such as piling and heavy ship timbers, 20 to 45 feet long. Farmers are generally not equipped to handle such heavy logs. They must be removed by contractors with heavy equipment. During the war, great quantities of such timbers were cut to supply the 18 shipbuilders in the state. At Leesburg, on the Maurice River, giant 1,200-ton naval rescue tugs were built entirely of wood. Incidentally, such vessels are 600 tons bigger than were the largest three-masted clipper ships of old.

Another specialized use of wood is for furnace poles. Logs as large as 19 inches in diameter are plunged into molten copper to purify it by their burning. Nearly any newly-cut wood will serve this purpose; and it brings \$1.25 a ton on the stump. Then there is an active basket-making industry in the southern part of the

state, in connection with the truck farms; while 200 thousand cords of fireplace wood are sold in the nearby residential areas every year.

In catering to such a specialized market, loggers do not cut destructively in the sense that the land is left denuded. Rather, they are given to culling the best trees, leaving the poorer to restock the forest. At the same time, damage to young growing stock may be considerable, due to careless felling. In such manner about 3,000 acres are logged each year, less than one percent of the operable timberland in the hardwood type. In view of this fact and the logging methods which, though bad, are not destructive, overcutting does not appear to be the most serious problem in New Jersey.

Other facts indicate that the forest is struggling back after three centuries of abuse; and that the people are regaining their once magnificent heritage. More than twice as many cubic feet of wood grew in 1944 as the 30,258,000 that were cut. Surveys by the Northeastern Forest Experiment Station already show a growing stock of 2,188,000,000 board feet and 13,703,000 cords of smaller wood.

Supplying only six percent of its needs, New Jersey is not a great lumbering state. But it can be a great forested one, and some day the traveler may see every acre of woodland growing healthy and beautiful trees. If all the billboards shall have fallen flat on their faces, the view will be immeasurably improved, in the opinion of many conservation-minded people.

AUTHORS and PHOTO CREDITS

JOHN L. BLACKFORD (*Desert Forest*) is a well known writer and photographic artist of Libby, Montana. WILLIAM J. DUCHAINE (*Lumberjack Tune Detective*) is managing editor of Michigan's *Escanaba Daily Press*. B. F. GRANT and A. E. PATTERSON (*Ten Years in Georgia Pine*) are both on leave of absence from the faculty of the School of Forestry, University of Georgia, to conduct the Georgia study. HENRY S. KERNAN (*Suburban Wilderness*) is regional consultant for the Northeastern states on the Forest Resource Appraisal. BURT P. KIRKLAND (*How Much Can Be Harvested?*) is a nationally known forest economist, also with the Appraisal. L. J. PESSIN (*Tunnel Dwellers*) is president of the New Orleans Academy of Sciences.

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C. A. Billings, page 212.
 John L. Blackford, pages 200, 201, 202 and 203.
 K. S. Brown, page 213.
 C. O. Buckingham, page 215.
 The Detroit News, page 217 (upper).
 A. M. Hartung, page 193.
 J. Horace McFarland Co., page 210.

Adolf Muller, page 211 (upper).
 New Jersey Department of Conservation, pages 222, 223, 224 and 225.
 Philip Palmer, page 227 (lower).
 U. S. Forest Service, page 234.
 Alfredo Valente, page 195.
 Eugene V. Zumwalt, pages 204, 206 and 207.

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Here's help for Planning Committees charged with the choice of a suitable means of permanent commemoration for the men and women who served in World War II.

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